

Rockwell Science Center

InP HBT PROCESS LOT FOLLOWER

ROC1-4A

Charge # 35016 - 87258-0000

ROC1-4A

Lot Identification	
Mask set: _____	Lot number: _____
Schedule Information	
Start date: _____	Wafers started: _____
Charge Information	
Wafer Fabrication and test: _____	
Process Layer Information	
List wafers in lot : Wafer Number DHBT 2429B3B4 DHBT 2429B3B3	No Substrate Number IQE baseline DHBT F8879.021XT IQE " " F8879.022XT IQE baseline SHBT F8879.025XT IQE " " F8879.027XT
Material sheets at the back of the folder	
Comments: Created by RLP 2/27/01,	

* DO NOT process at the same time as Roc1-4b & Roc1-4c. Thanks!

Rockwell Science Center

Charge # 35016 - 87258-0000

INP HBT PROCESS LOT FOLLOWER

Emitter Contact / Alignment Marks	Step	Date/ Oper.	Tools	Step operation (6 WFRS)	Operation recipe	Notes
Water clean	0.1	4/18/01	Wet station	Dip, dry	NH4OH (2%), 30sec, DI rinse, 30sec, N2 blow dry	
Close Couple with PR	1	4/19/01	YES Oven	HMDS Dep	Program 0 ✓	REWORK 4-19-01 ER
Apply resist/bake (target 2.5um)	2	4-19-01	Solitec Coat	Resist type Spin resist Hotplate bake	3625E 5-102 576 2600 RPM 60 sec 3500 RPM 30 sec 110C, 60sec	REWORK WITH 511 4-20-01 ER
Expose Device Mask	5	4/19/01	GCA Stepper	Mask / Reticle name Global align to DFAS align to Vernier align to Job name pass	ROC1 / Layer 1B This should be a light field mask! Blind Step TX ROLL 511 ✓	A-20-01 744
Image Reversal Bake	5.1	4/23/01	YES Oven	Ammonia Program: 3		
Flood	5.2	4/23/01	Flood Unit	Dose	600 mj 1000MS	
Develop	6	4/23/01	Solitec DEV.	Develop Type: Develop Time:	701 60 Sec.	
Inspect wafers	7	4/23/01	Optical scope	View wafers	Equipment type A O Microscope <input type="checkbox"/> Check for patterns properly developed <input type="checkbox"/> Check alignment (+/- 0.25um) <input type="checkbox"/> Smallest Resolution Pattern Read (um) Acceptance: Yes, No O2, 500mT, 300W, 4min	
Descum	0.7	4/25/01	Branson 1	Descum	20% HCl 30sec, DI rinse, 30sec, N2 blow dry	
Dip Etch	0.1	4/25/01	Wet station	Dip, dry		
Metal deposition	0.9	4/25/01	CRYO evaporator IL # 63	Metal dep Ti/Pt/Au/Ti Metal dep check	150 / 200 / 5000 / 30 Record film thickness from crystal monitor	
Liftoff	0.10	4/25/01	Wet bench	Liftoff Rinse Dry Clean backside	Acetone soak, >10min IPA soak, 1min N2 blow Scrape flakes off backside with razor blade if needed	View ACE Soak 4/26/01 1PA Soak DI Rinse 520 DRY 511
Inspect wafers	0.11	4/26/01	Optical scope	Inspect wafers	Metal appearance Check that alignment marks are completely lifted	BACKSIDE TOUCHED WAFERS REQUIRE WITHOUT SETS UNFOULATED WAFERS WITH SETS TIR 744 TEST W/ TIR 4um

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Charge # 35016 - 87258-0000

Emitter Mesa Etch	Step	Date/ Oper.	Tools	Step operation	Operation recipe	Notes
Measure step height		4/26 Smt	Dektak	Measure Metal pattern Measure PR pattern	Record Data	
Descum	0.7	4/26 Smt	Branson I	Descum	O2, 500mT, 300W, 4min	
Etch emitter mesa	0.8	4/26 Smt	Wet bench / Dektak	Dektak Dip Rinse Etch Rinse Dektak	Record etch sheet : NH4OH (2%) + tergitol 30 sec : DI Rise 1:8:160 HS3O4 + H2O2 +H2O + Tergital 60% 21 HCl : H2O + Tergital	
Measure step height		4/26 Smt	Dektak	Measure Metal pattern Measure PR pattern	Record Data Record Etch depth and Rate	
Inspect wafers	0.6	5/29 Smt	Optical scope	View wafers	Equipment type A O Microscope o Check for complete etch Acceptance : Yes <input checked="" type="checkbox"/> , No <input type="checkbox"/>	

E3 7700 Emission Mesotrich

E2 6650

25 E1 5750

M. 5050

E1 700

E2 900

1600

E3 1050

2650

27

7800

5050

2750

2% NH_4OH

30 sec.

23.3A/sec. 1:8:160

30 sec.

+50 sec.

15 sec.

dy.

60% HCl

30 - 1:30 - 25

21

2650⁰A

30 - 1:30 - 13

22

2750⁰A

30 - 1:30 - 13

No #



2350⁰A

30 - 1:30 - 12

1:8:160 overexposed by ≈ 20 sec.
waiting for color change that
didn't come

No #



2250⁰A

30 - 1:15 - 12

Rockwell Science Center

InP HBT PROCESS LOT FOLLOWER

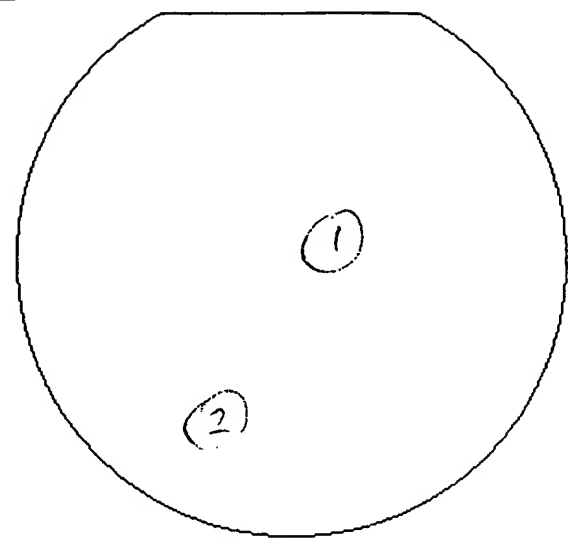
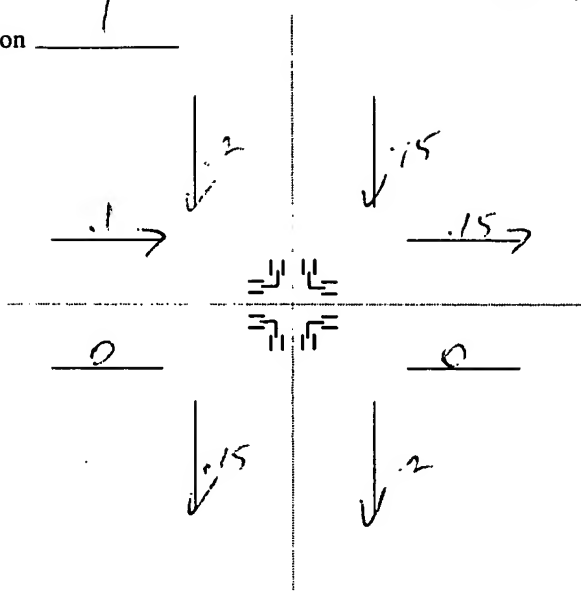
Charge # 35016-87258-0000

SWAFEN

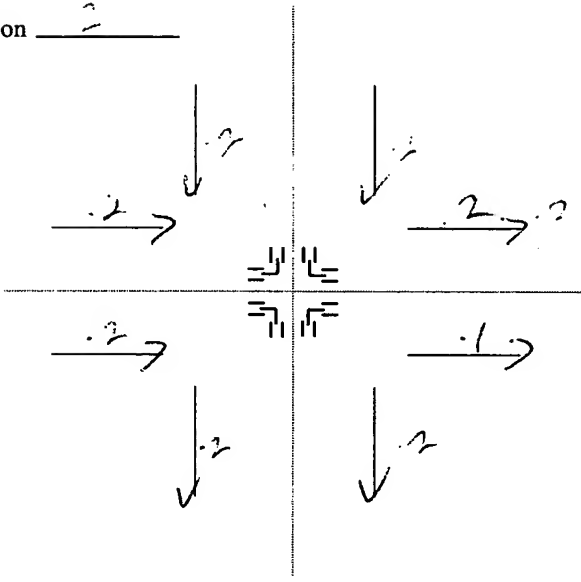
Base Metal (Optical)	Step	Date/ Oper.	Tools	Step operation	Operation recipe	Notes
Wafer clean Close Couple with PR	0.1	4/24	Wet station	Dip, dry	NH4OH (2%), 30sec, DI rinse, 30sec, N2 blow dry	
HMDS Dep	1	4/24	YES Oven	HMDS Dep	Program 0	
Apply resist/bake (target 2.5um)	2	4/24	Solitec Coat	Resist type Spin resist Hotplate bake	511 4000 2600 RPM 60 sec 110C, 60sec	
Expose Device Mask	5	4/24	GCA Stepper	Mask / Reticle name Global align to DFAS align to Vernier align to Job name\ pass	ROC1 / Layer 5 13 1 1 1 MAL ROC1.3/17,5	
Image Reversal Bake	5.1	4/24	YES Oven	Ammonia Program:	3	
Flood	5.2	4/27	Flood Unit	Dose	1000 mj ✓	
Develop	6	4/27	Solitec DEV.	Develop Type: Develop Time:	701 ✓ 60 Sec ✓	
Inspect wafers	7	4/27	Optical scope	View wafers	Equipment type A O Microscope o Check for patterns properly developed o Check alignment (+/- 0.25um) o Smallest Resolution Pattern Read .8 (um) Acceptance: Yes ✓, No	XO Y+2
Descum	0.7	4/30	Branson 1	Descum	O2, 500mT, 300W, 4min	
Dip Etch	0.1	4/30	Wet station	Dip, dry	20% HCl 30sec, DI rinse, 30sec, N2 blow dry	
Metal deposition	0.9	4/30	CRYO evaporator	Metal dep Ti/Pu/Au/Ti Metal dep check	100 / 150 / 1500 / 30 Record film thickness from crystal monitor	
Liftoff	0.10	4/30	Wet bench	Liftoff Rinse Dry Clean backside	Acetone soak, >10min IPA soak, 1min N2 blow Scrape flakes off backside with razor blade if needed	
Inspect wafers	0.11	5/1	Optical scope	Inspect wafers	Metal appearance Check that alignment marks are completely lifted	

Wafer # 021

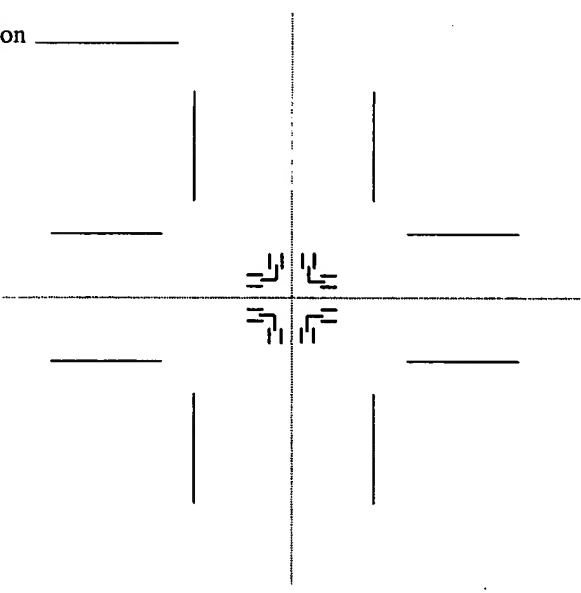
Location 1



Location 2

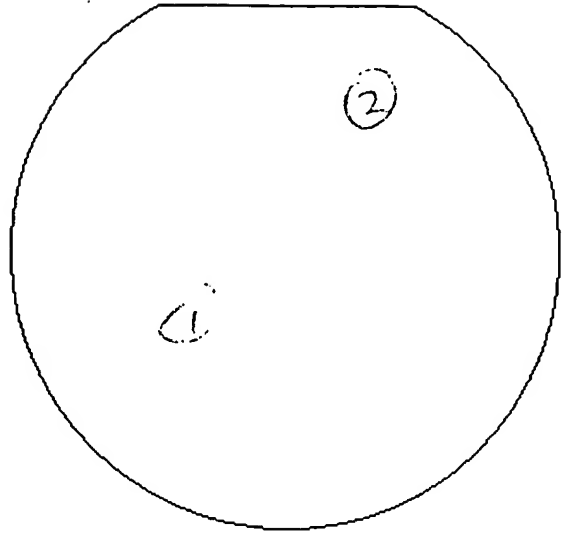
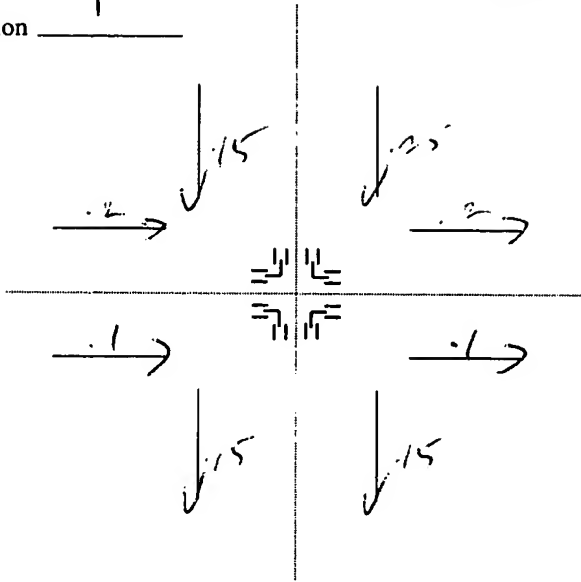


Location _____

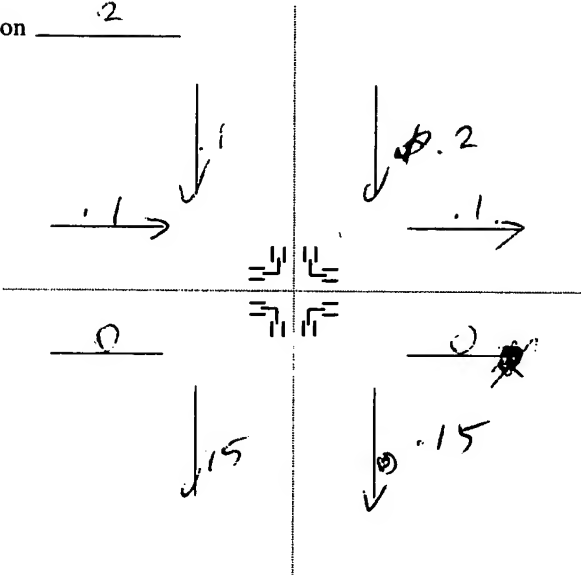


Wafer # 025

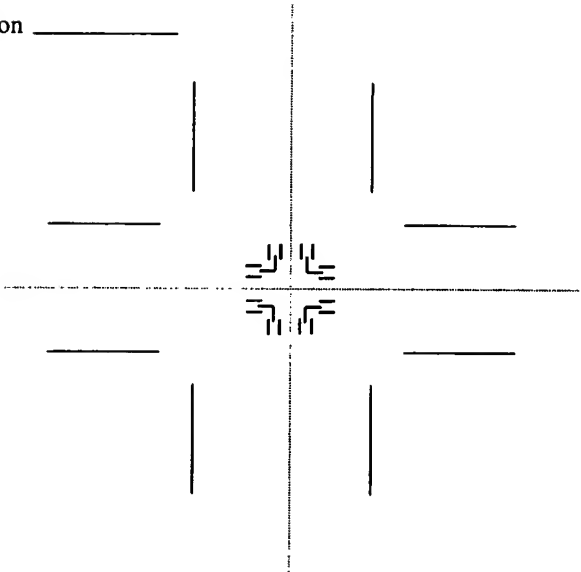
Location 1



Location 2

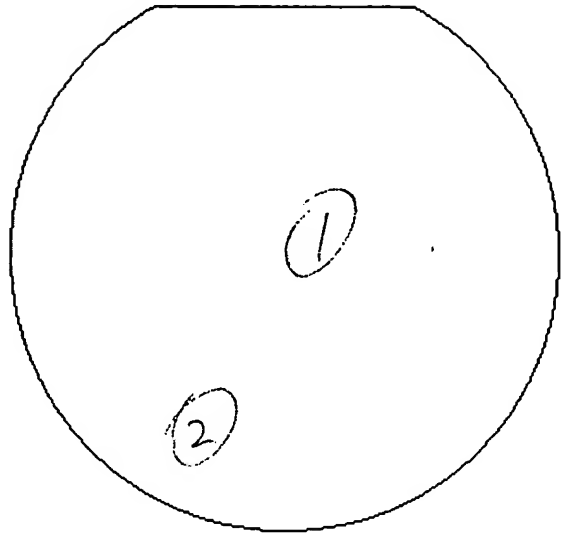
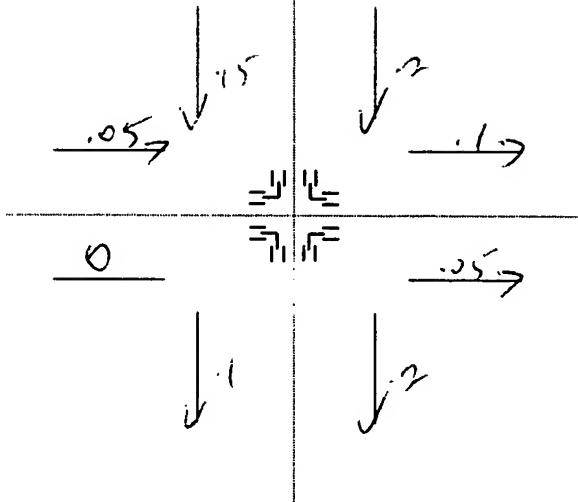


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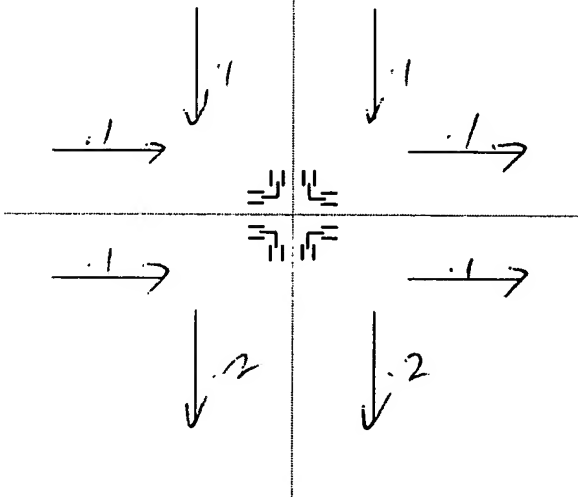


Wafer # N3 #

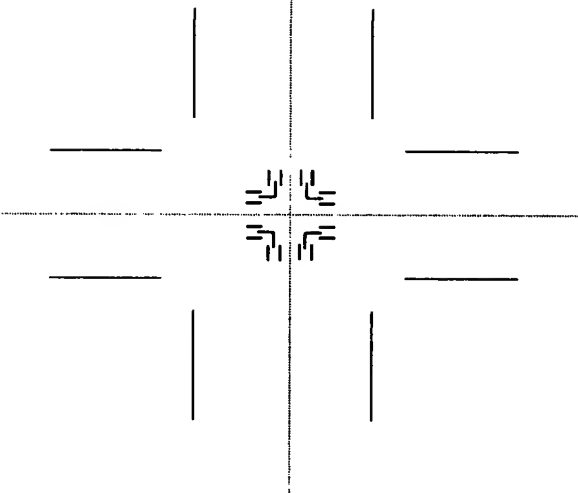
Location 1



Location 2

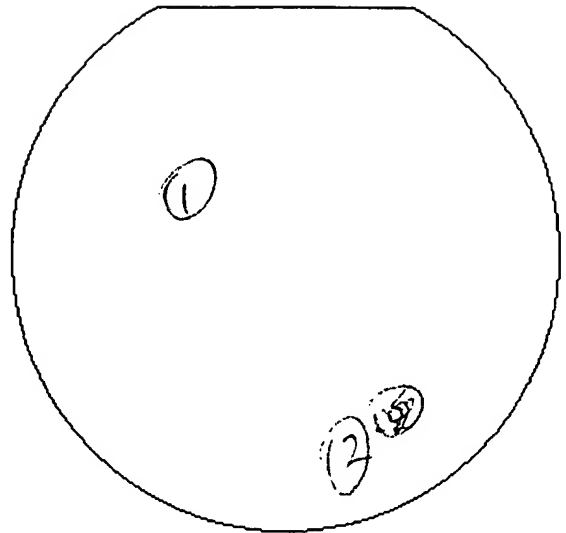
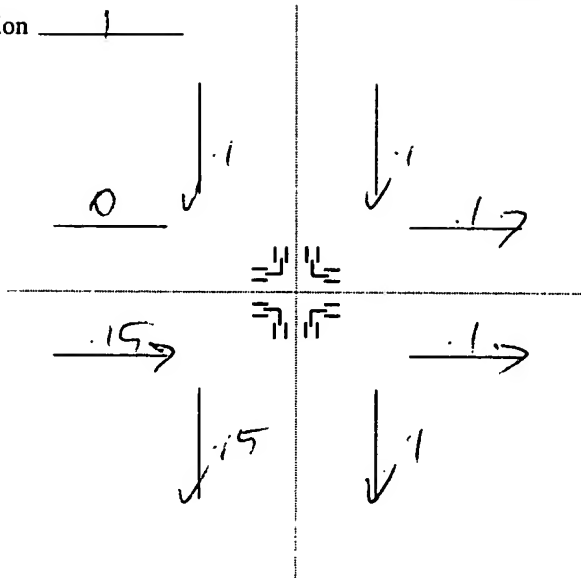


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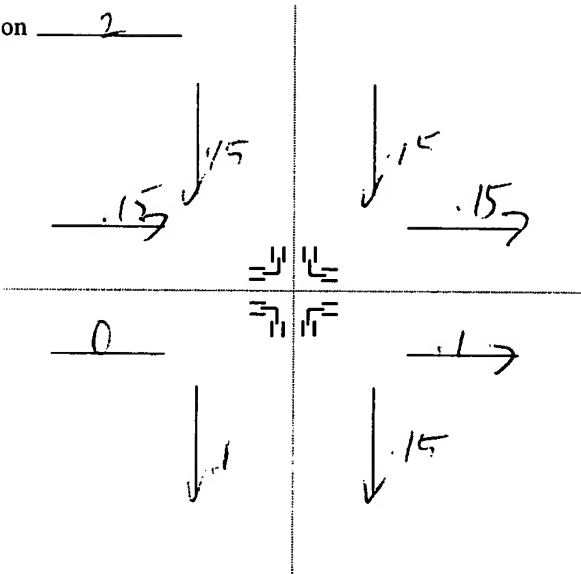


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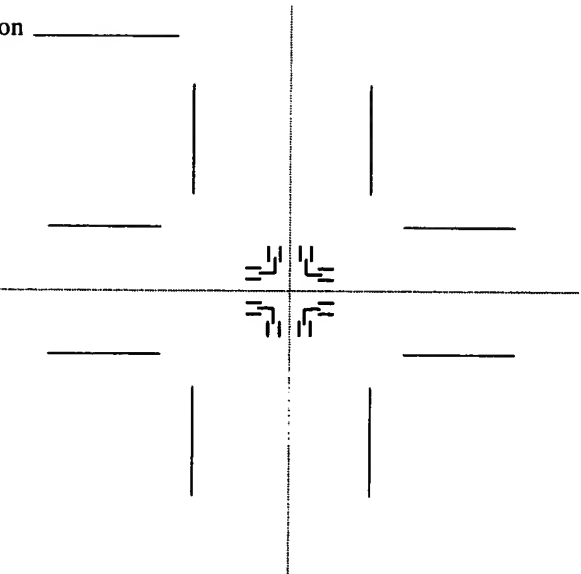
Location 1



Location 2

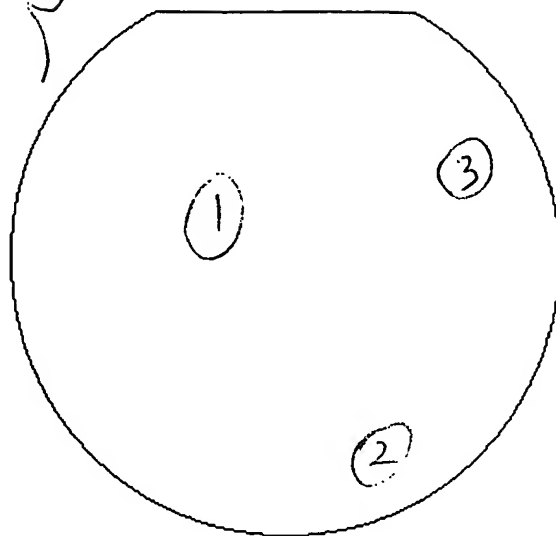
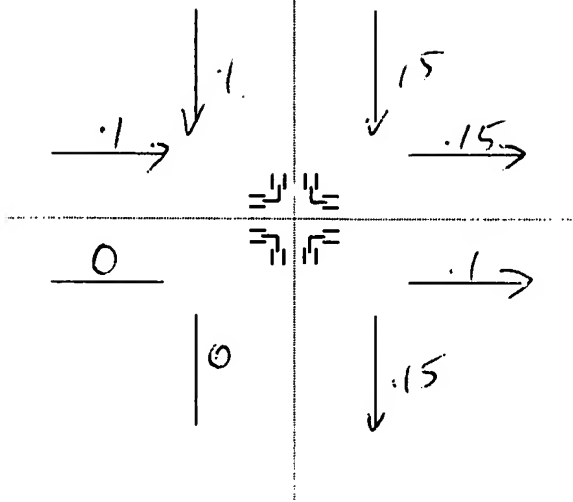


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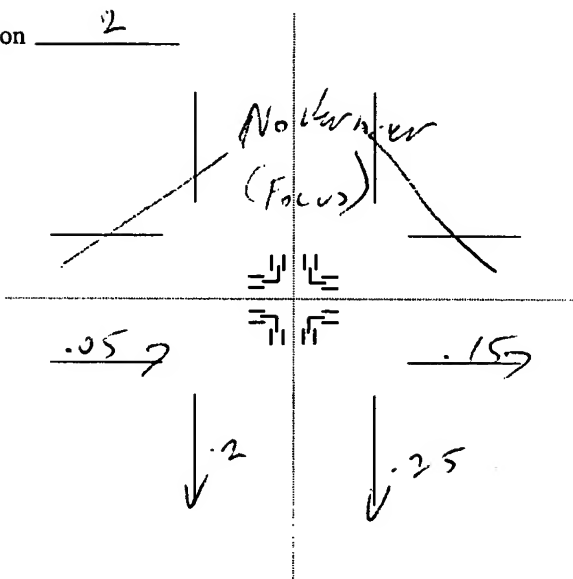


Wafer # No #

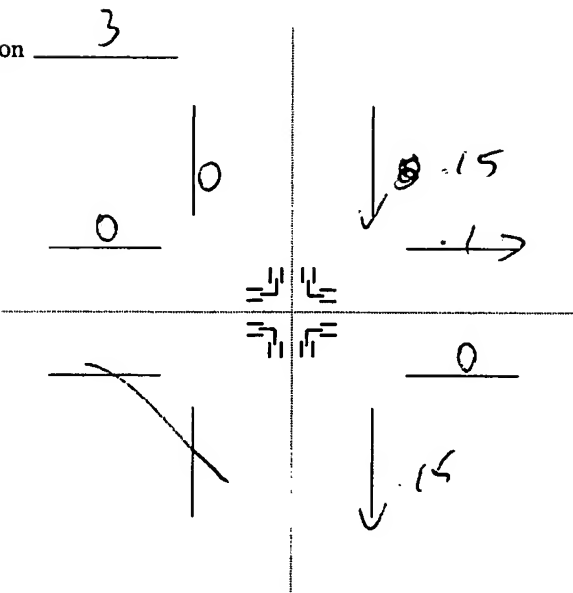
Location 1



Location 2

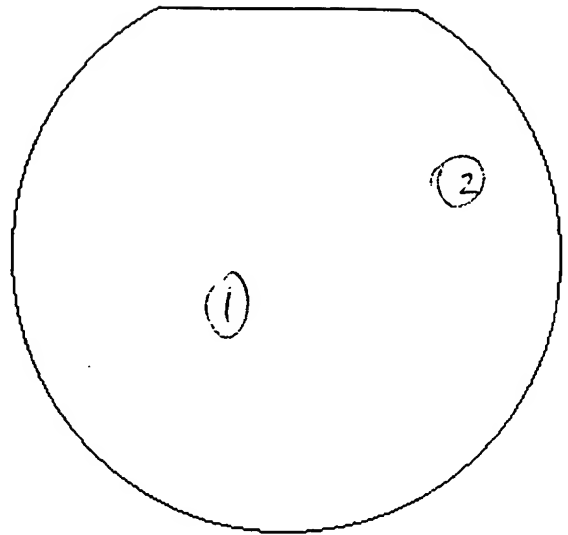
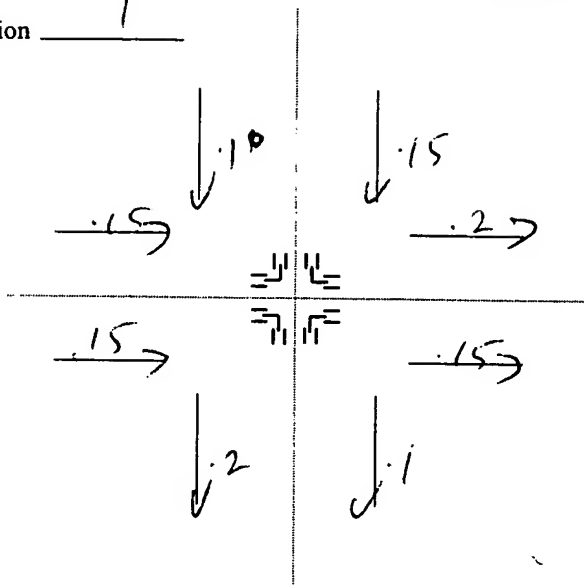


Location 3

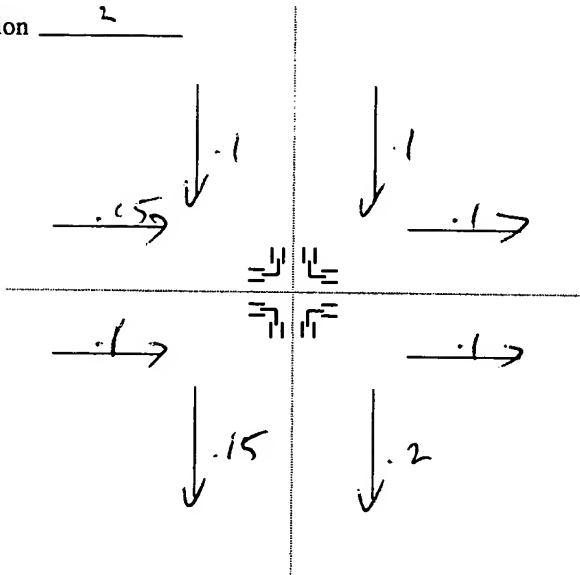


Wafer # 022

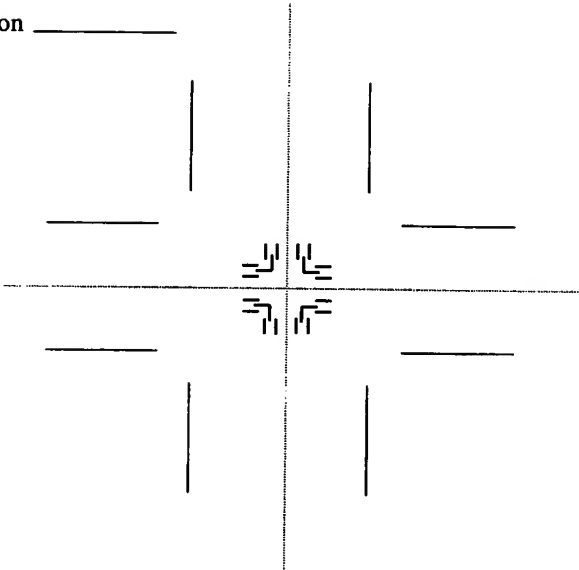
Location 1



Location 2



Location _____



Rockwell Science Center

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Charge # 35016 - 87258-0000

(6 WFS)

Base Pedestal	Step	Date/ Oper.	Tools	Step operation	Operation recipe	Notes
Wafer clean	0.1	5/1/01 S-H	Wet station	Dip. dry	NH4OH (2%), 30sec, DI rinse, 30sec, N2 blow dry	
HMDS Dep	1	5-1 ER	YES Oven	HMDS Dep	Program 0 ✓	
Apply resist/bake (target 2.5 um)	2	5-1 ER	Solitec Coat		Resist type 511 ✓ Spin resist 4000 RPM (3000) 30 sec ✓ Hotplate bake 110C, 60sec ✓	
Expose Device Mask	5	5-1 PA	GCA Stepper		Mask / Reticle name ROC11 / Layer 4 Global align to 1 DFAS align to 1 Vernier align to 1 Job name pass 1 Develop Type: 701 Develop Time: 60 Sec. ✓	EXP -6 MAP ROC11.2/17/4
Develop	6	5-1 ER	Solitec DEV.			
Inspect wafers	7	5-1 PA	Optical scope	View wafers	Equipment type A O Microscope Check for patterns properly developed Check alignment (+/- 0.25um) Smallest Resolution Pattern Read 0.8 (um) Acceptance: Yes, No	
Post Bake		5-1 S-H	Ovens in Lab 335	Post bake PR	90C 30min	5/4 5-1
Descum	0.7	5-1 PA	Branson 1	Descum	O2, 500mT, 300W, 4min	
Pedestal Etch	0.8		Wet bench	Descum See shorts		
PR strip	0.10	5/1/01 S-H	Wet bench	Liftoff Rinse Dry	Acetone soak, 10min IPA soak, 1min N2 blow	
Inspect wafers	0.11	5-1 PA	Optical scope	View wafers	Check SiO appearance	

Wafer 025

Comments and Pictures:

Wafer 027

$I-V$ AFTER HCL
very linear $\sim 150 \Omega$

[illegible]

Comments and Pictures:

Charge # 35016 -
Lot # 2001-4

DH31 Step BP

Comments and Pictures:

~~1360~~
~~10750~~

Charge # 35016 - 87258-0000

Charge # 35016 -
Lot # 2001-4

T FOLLOWER
Step 3

Wafer 022

[illegible]

Comments and Pictures:

$I-U$ was linear $r^2 = 0.65$

Charge # 35016 - 87258-0000
Lot # 2001-4

InP HBT PROCESS LOT FOLLOWER
Step 132

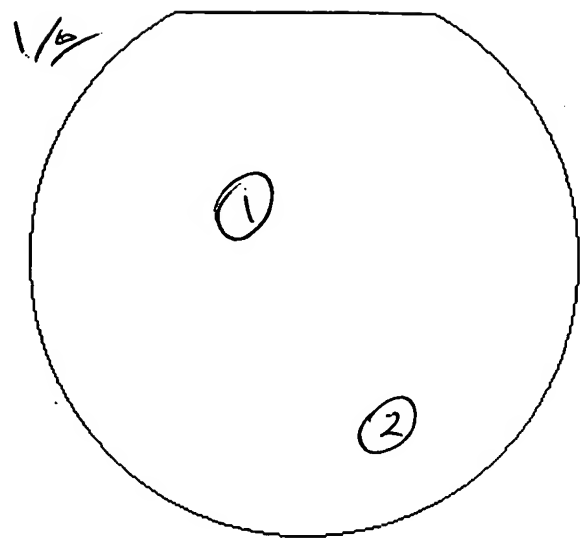
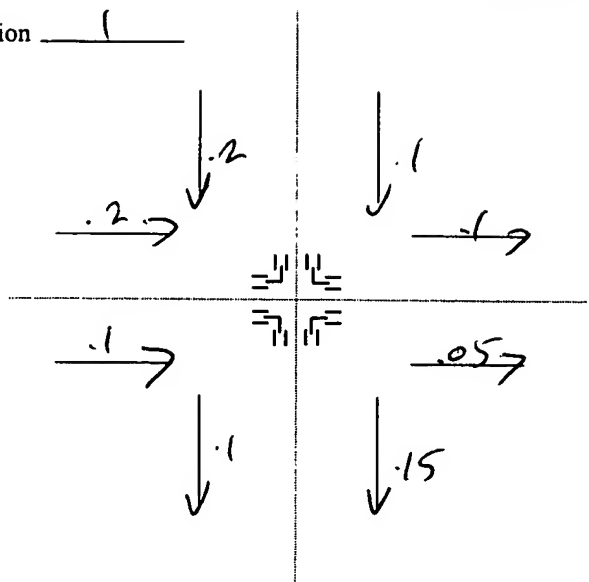
Wafer No # 1

Etch Time	Etchant	Ref THK	DEKTAK	Etch Amount	Etch Rate
30 "	1:8:160	10800	etch by color		
10 "	2:1:100				
120 "					
30 "	1:8:160	10775	etched by color		
10 "	2:1:100				

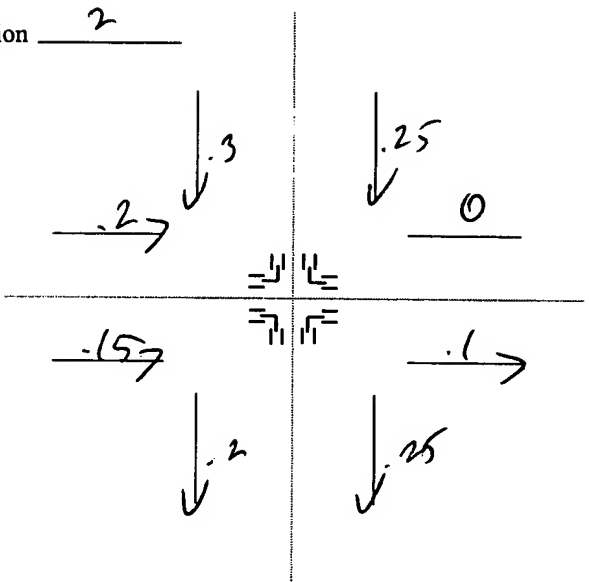
Comments and Pictures:

Wafer # no #

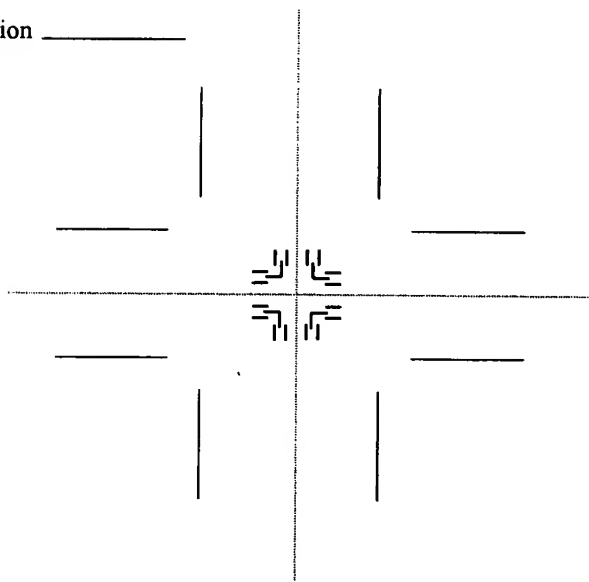
Location 1



Location 2

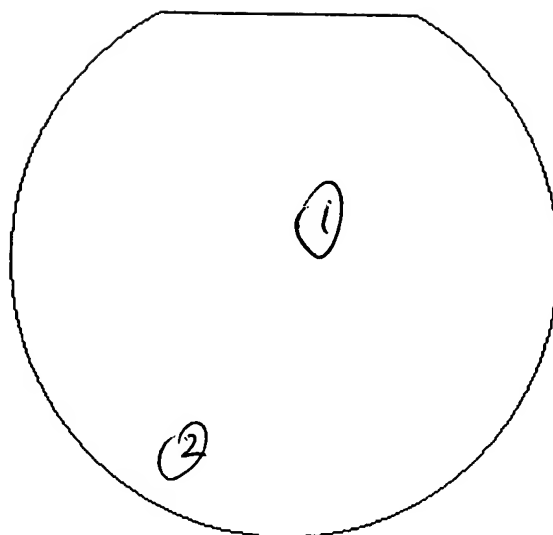
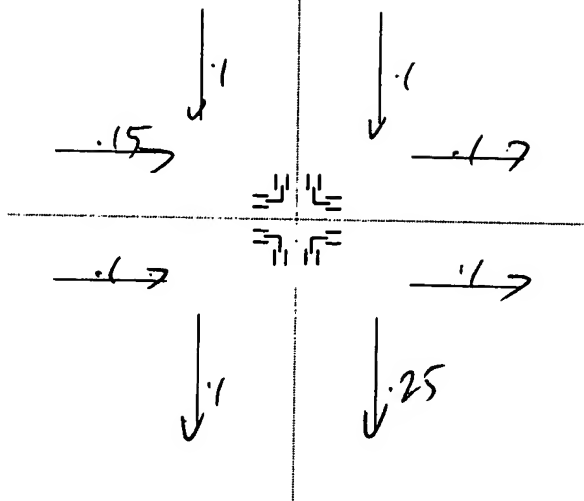


Location _____

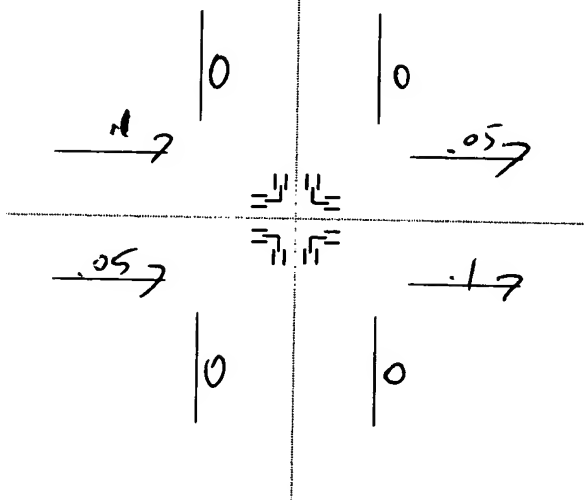


Wafer # 027

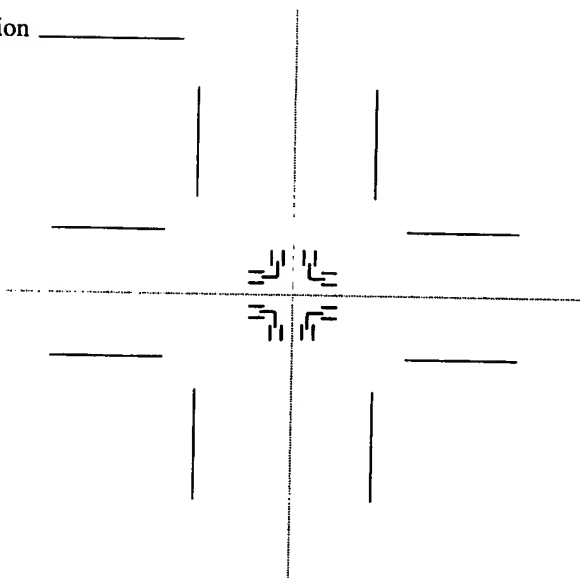
Location 1



Location 2

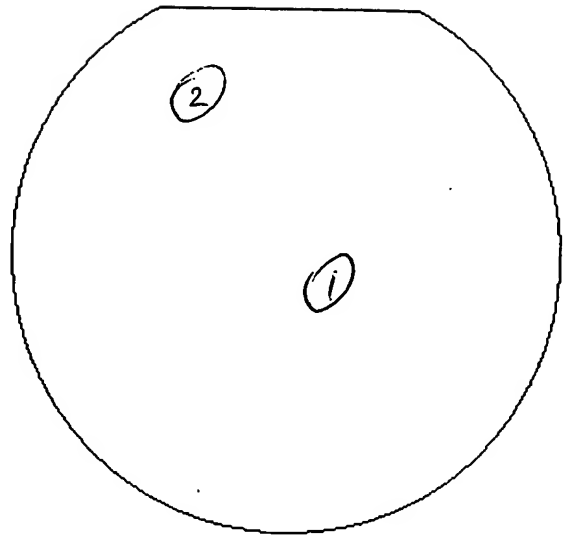
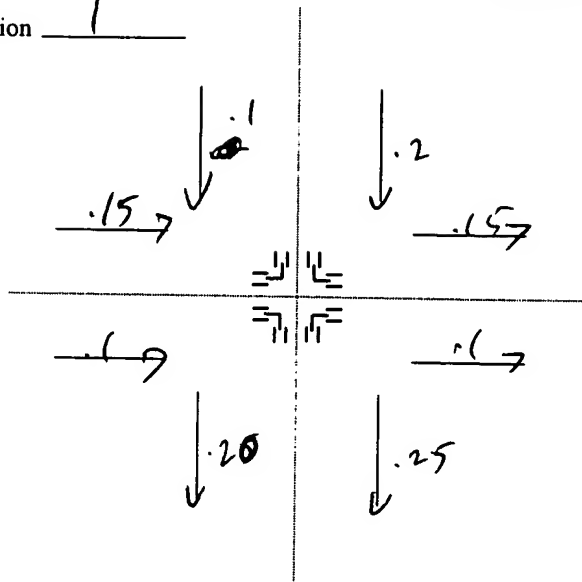


Location

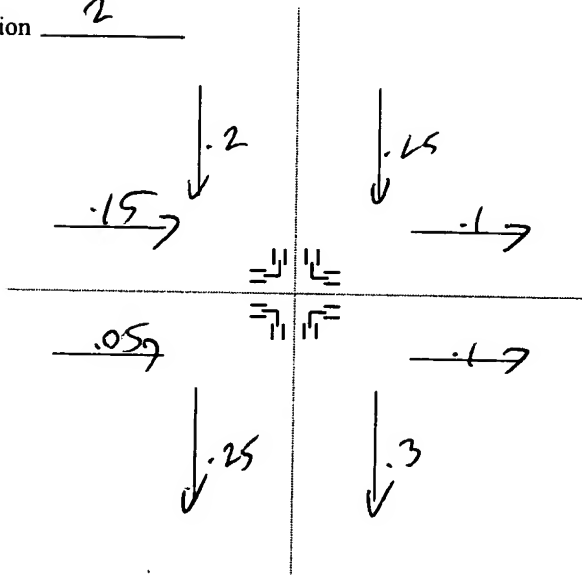


Wafer # 22

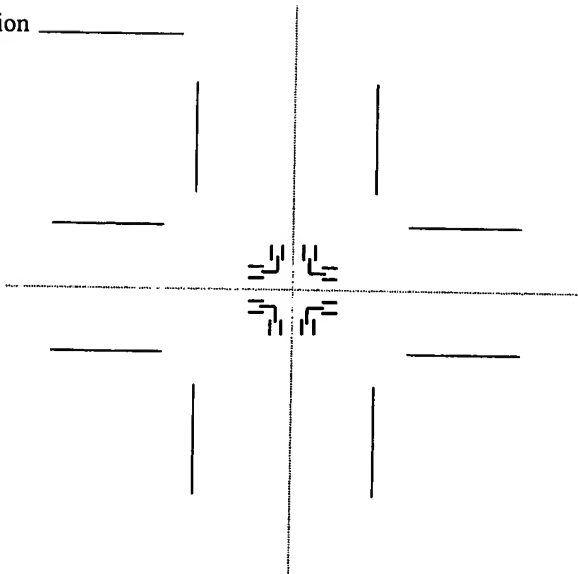
Location 1



Location 2

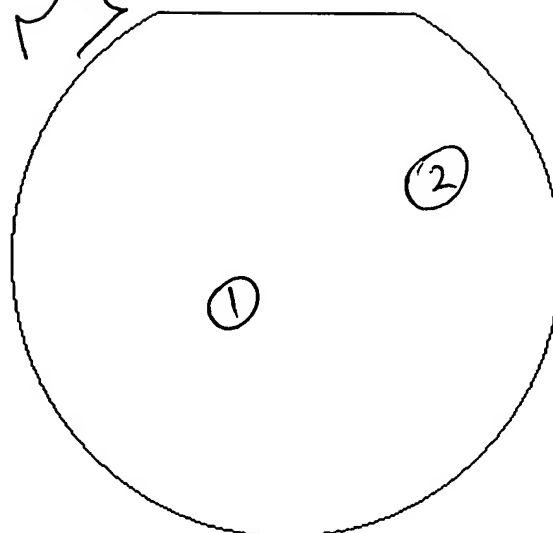
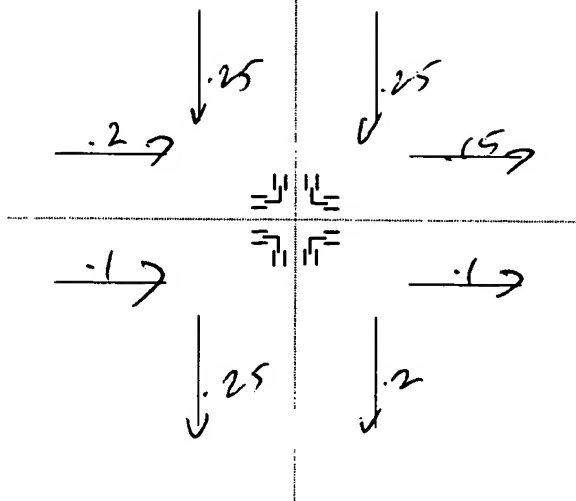


Location _____

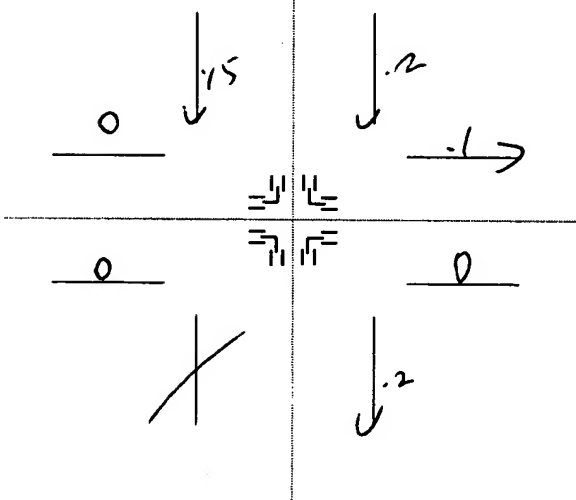


Location 1

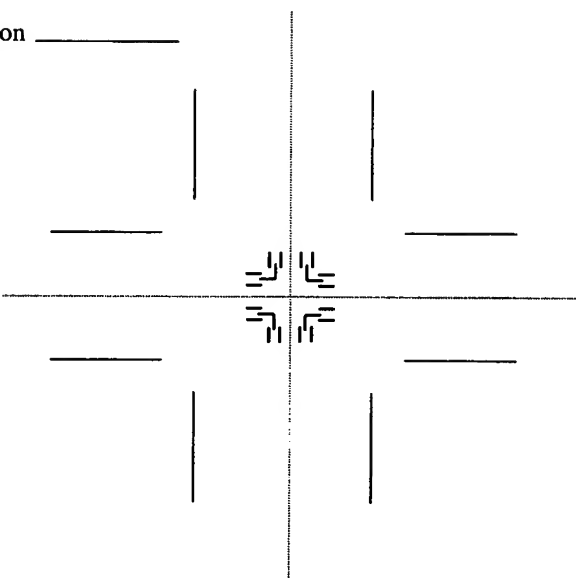
Wafer # W0 #



Location 2

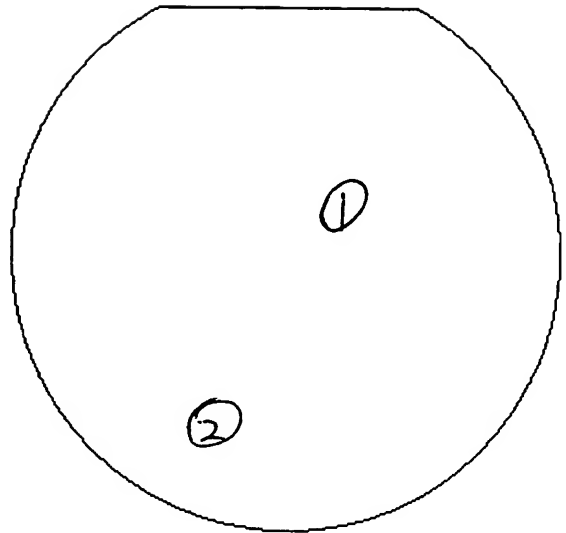
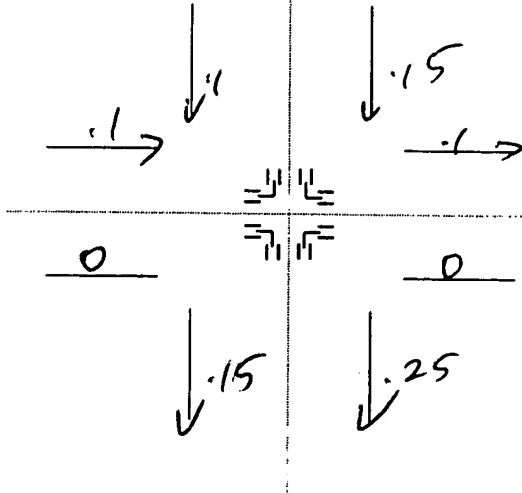


Location _____

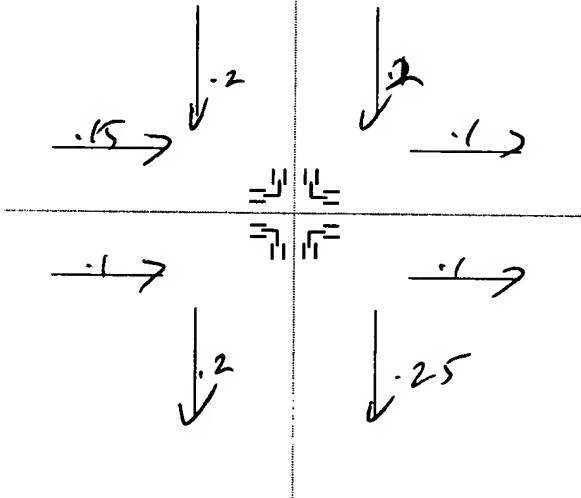


Wafer # 021

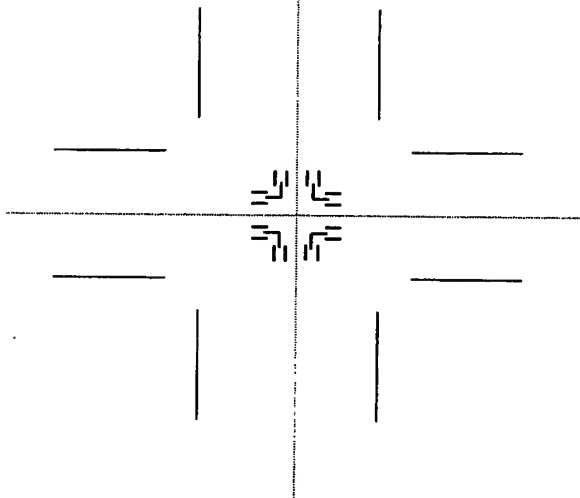
Location _____



Location 2

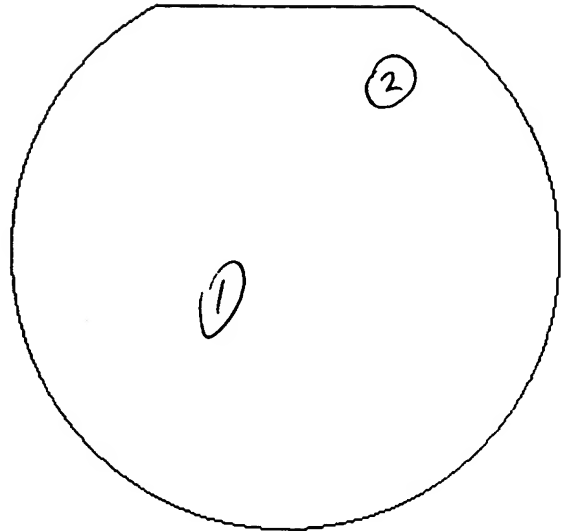
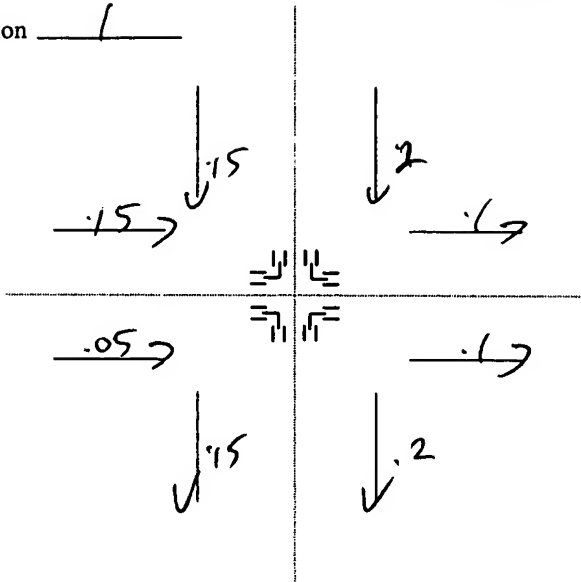


Location _____

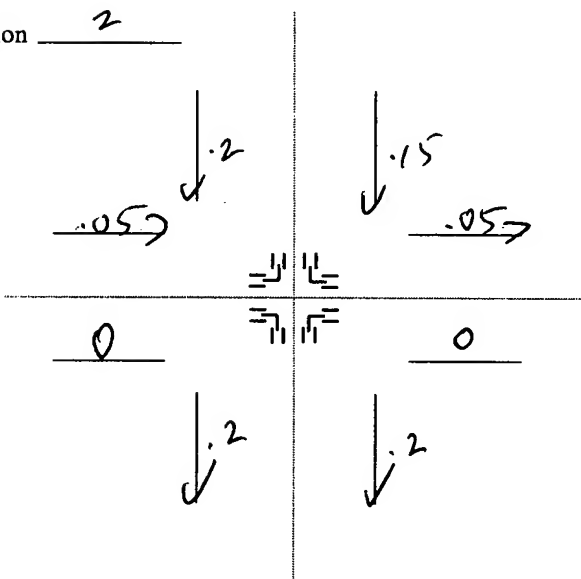


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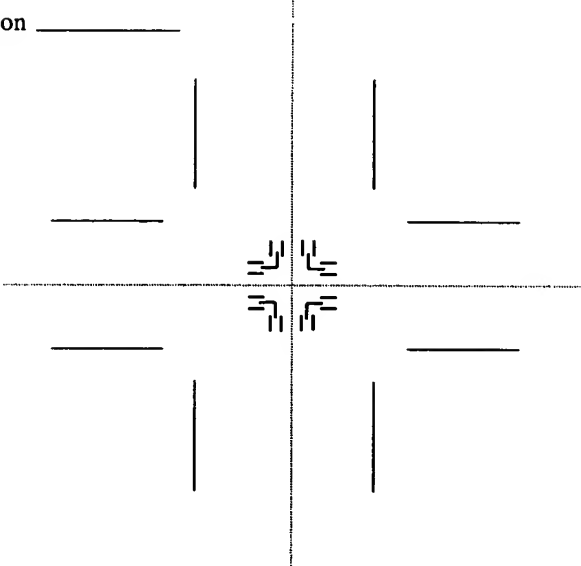
Location 1



Location 2



Location _____



Rockwell Science Center

InP HBT PROCESS LOT FOLLOWER

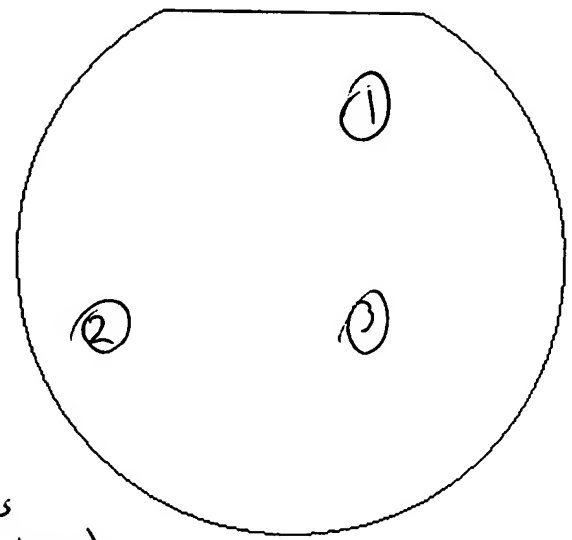
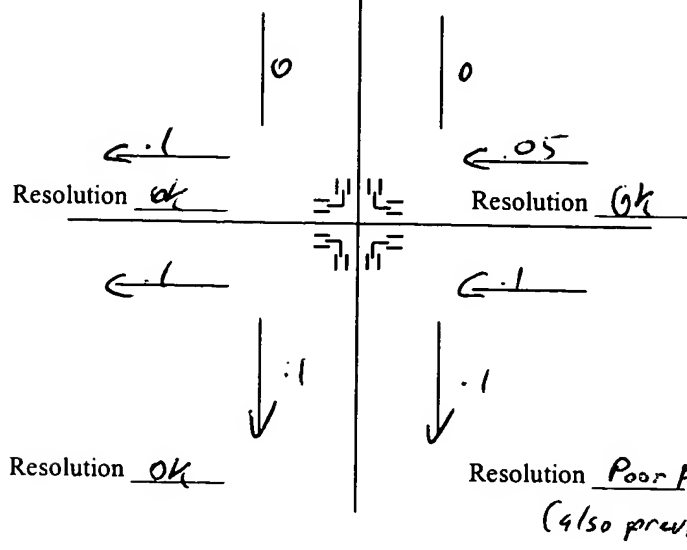
Charge # 35016-87258-0000

GWAFRO

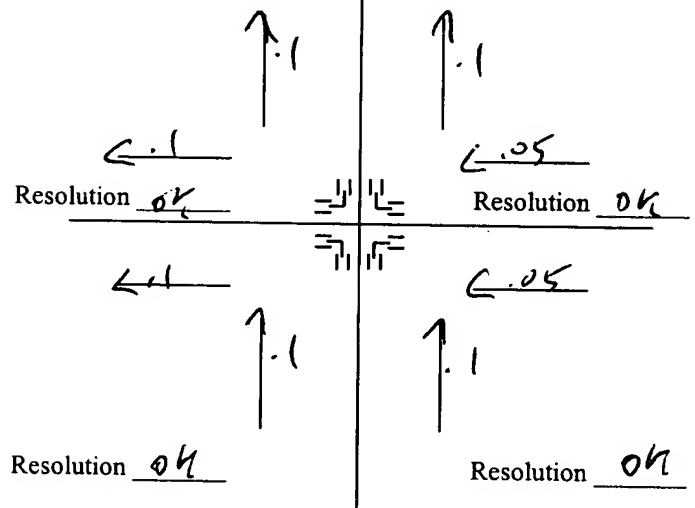
Collector Contact	Step	Date/ Oper.	Tools	Step operation	Operation recipe	Notes
Wet clean Close Coupla with PR	0.1		Wet station	Dip, dry	HMDS (2%), 30sec, DI time, 30sec, N2 blow dry	
HMDS Dep	1	5/11/94	YES Oven	HMDS Dep	Program 0	
Apply resist/bake (target 2.5um)	2	5/11/94	Solitec Coat		Resist type 511 Spin resist 2000 RPM 60sec Hotplate bake 110C, 60sec 4000 RPM 30.5 sec	
Expose Device Mask	5	5/11/94	GCA Stepper	Mask / Reticle name Global align to 1 DFAS align to 1 Vernier align to 1 Job name: pass Ammonia Program: 3	ROC1 / Layer 7 B MAP ROC1-3/14,7 .5	
Image Reversal Bake	5.1	5/11/94	YES Oven			
Flood	5.2	5/11/94	Flood Unit		Dose 1000 mj	
Develop	6	5/11/94	Solitec DEV.	Develop Type: 701 Develop Time: 60 Sec.		
Inspect wafers	7	5/11/94	Optical scope	View wafers	Equipment type A O Microscope Check for patterns properly developed Check alignment (+/- 0.25um) Smallest Resolution Pattern Read (um) Acceptance: Yes, No HCl, 20% + 4 drops tergitol 30sec DI, 15sec, N2 blow dry	X = .1 Y = 0 5/14 5-4 02 Decen 1994
Pre-metal surface prep (not needed if materials closed coupled with etch)	0.8		Wet bench	Dip Rinse, dry		
Metal deposition	0.9	5/16/94	CRYO evaporator	Metal dep Ti/Pt/Au Metal dep check	150 / 200 / 5000 / 30 Record film thicknesses from crystal monitor Acetone soak, >10min IPA soak, 1min N2 blow Scrape flakes off backside with razor blade if needed Metal appearance	111 #46
Liftoff	0.10	5/15/94	Wet bench	Liftoff Rinse Dry Clean backside Inspect wafers		
Inspect wafers	0.11	5/15/94	Optical scope			

Lot #: R0C1-4 Wafer #: 025 Layer #: 7

Location 1



Location 2

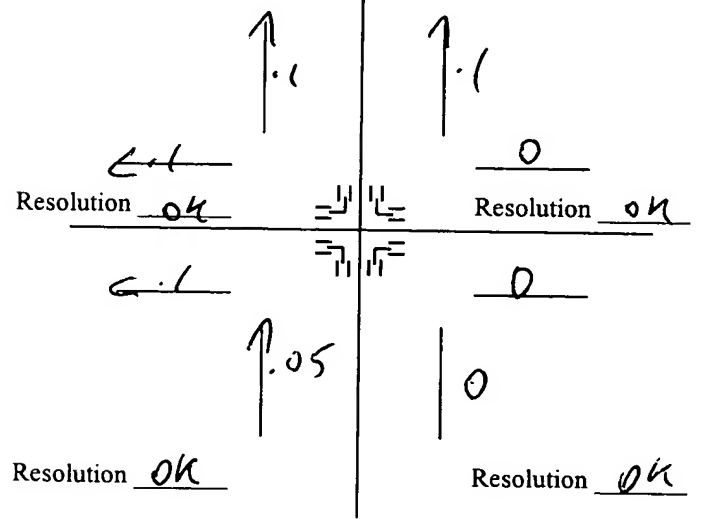


AVG. X .07
AVG. Y .075

☐ Rework
☒ Accept

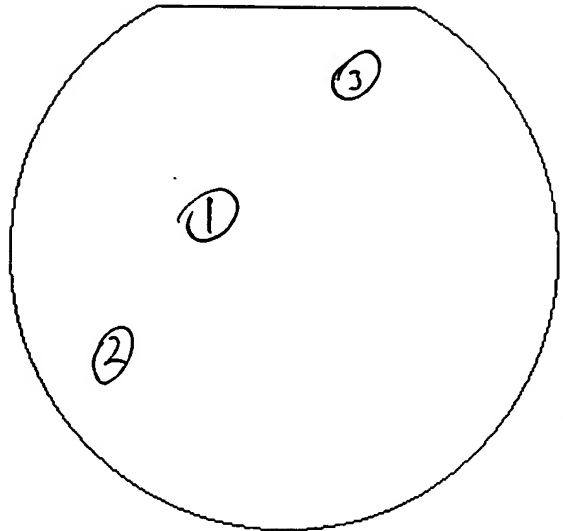
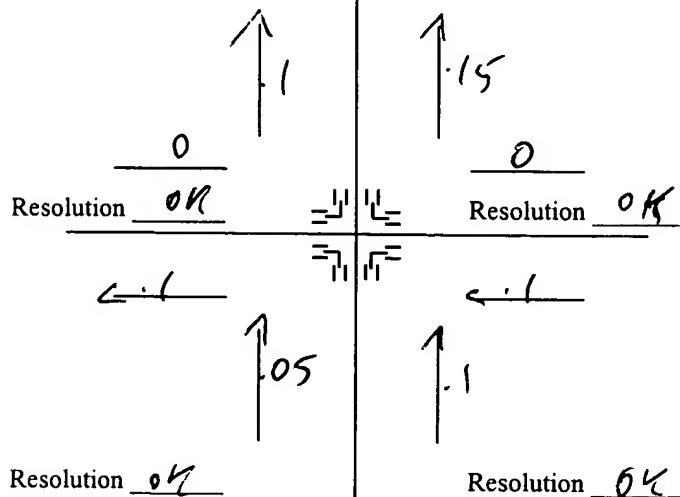
Initial Smith

Location 3

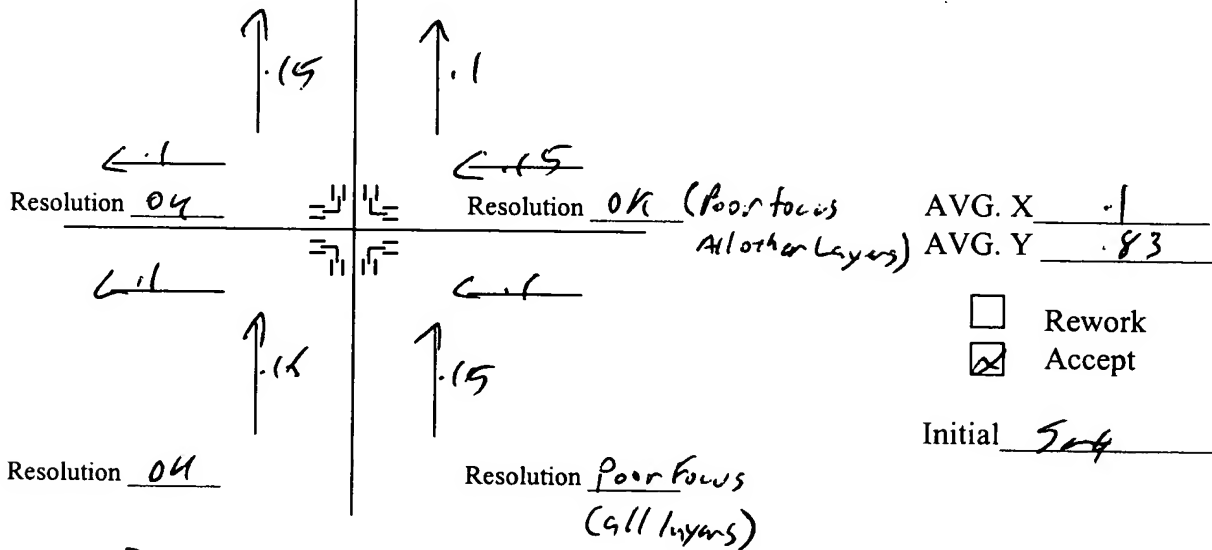


Lot #: ROCI-4 Wafer #: 027 Layer #: 2

Location C



Location 2

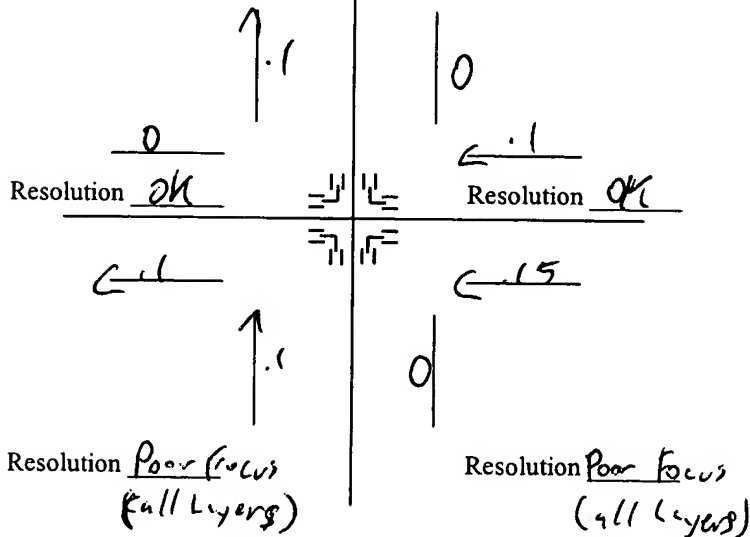


AVG. X .1
AVG. Y .83

☐ Rework
☒ Accept

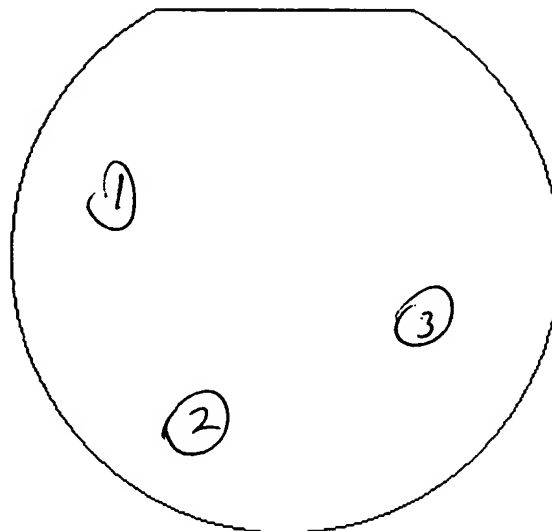
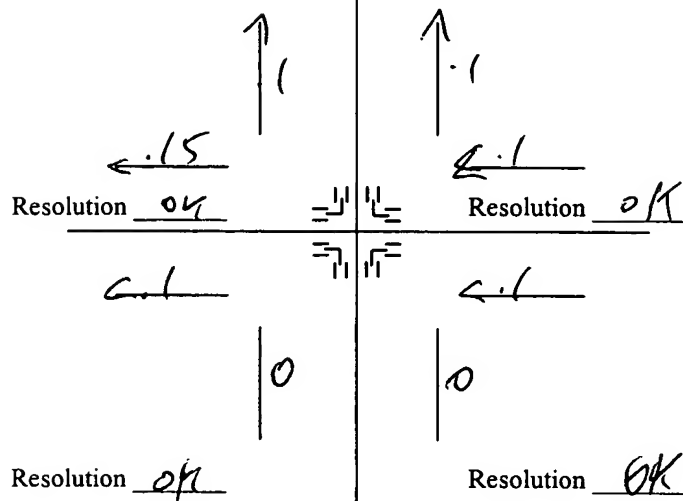
Initial 504

Location 3

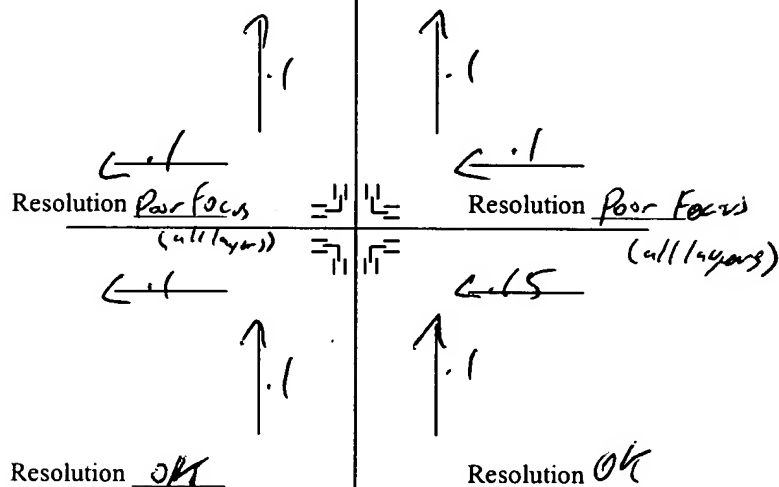


Lot #: R0C1-4 Wafer #: 021 Layer #: 7

Location 1



Location 2

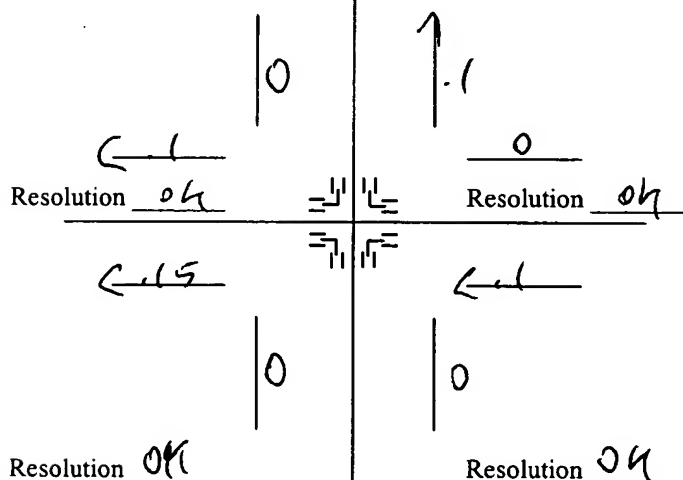


AVG. X .1
AVG. Y .58

☐ Rework
☒ Accept

Initial Sing

Location 3



Lot #: R061-4 Wafer #: 110th Layer #: 7

Location 1

Resolution OK

Resolution OK

Resolution Poor Focus
(reg. by Prod. other layers)

Resolution Poor Focus
(all layers)

Location 2

Resolution OK

Resolution OK

Resolution OK

Resolution Poor Focus
(all layers)

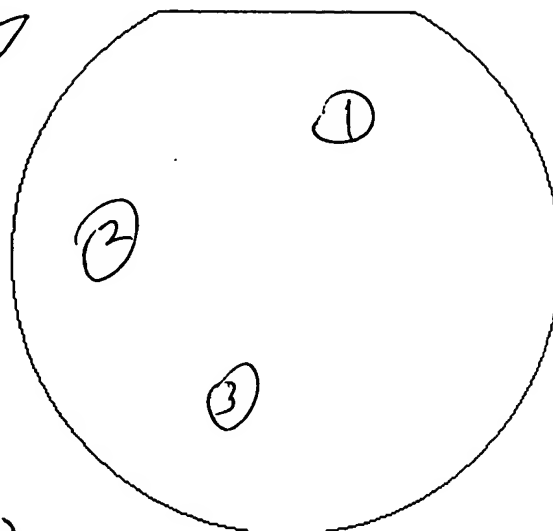
Location 3

Resolution Poor Focus (all layers)

Resolution Poor Focus (all layers)

Resolution OK

Resolution OK



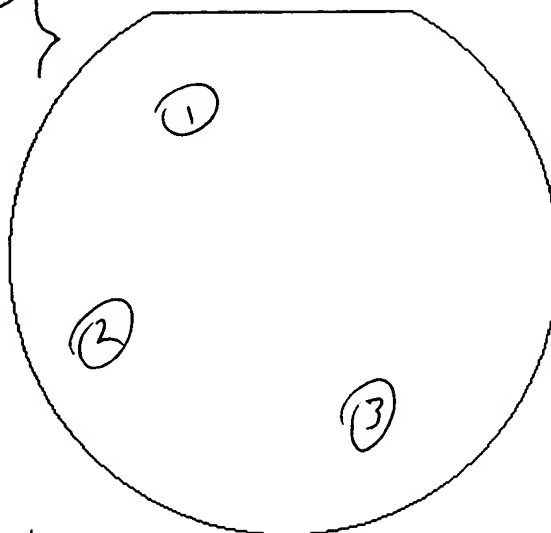
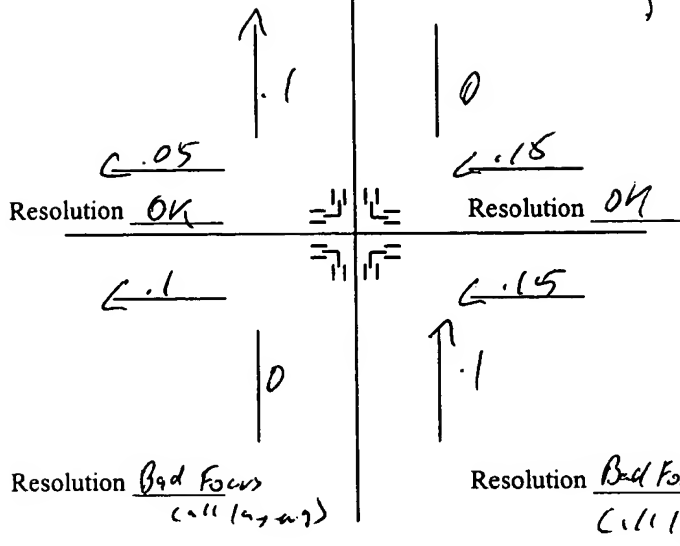
AVG. X 5.1
AVG. Y .1

☐ Rework
☒ Accept

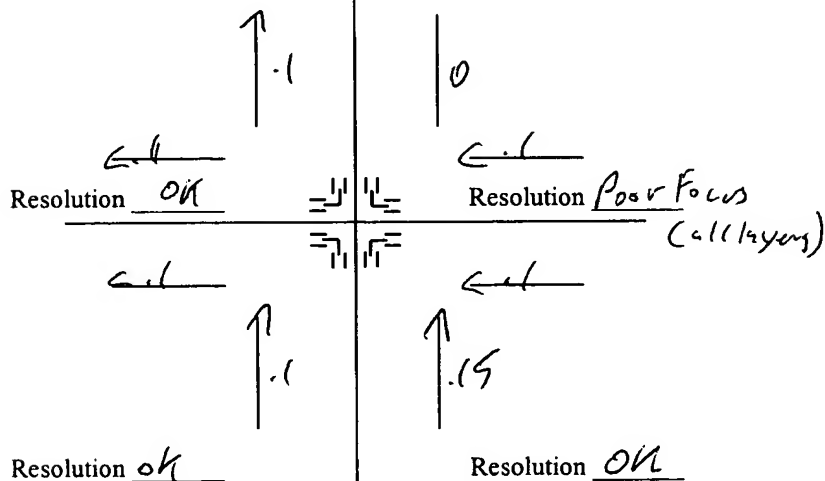
Initial Sm

Lot #: ROC 1-4 Wafer #: No# Layer #: 7

Location 1



Location 2

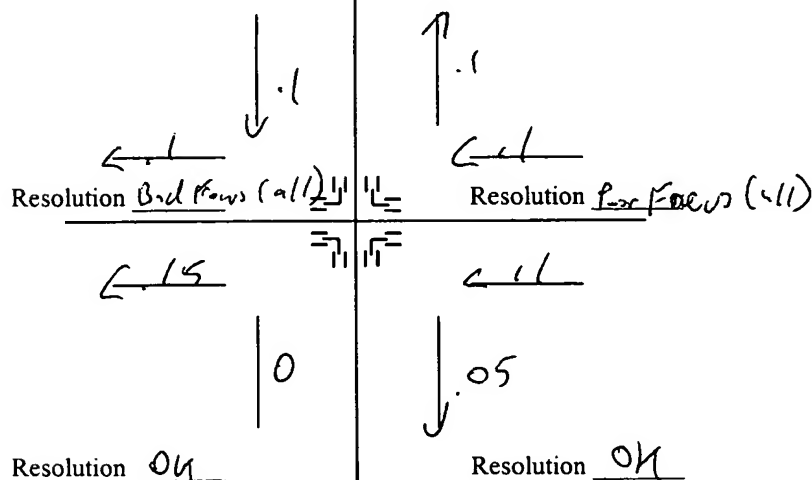


AVG. X .108
AVG. Y .067

☐ Rework
☒ Accept

Initial Sam

Location 3



Rockwell Science Center

ImP HBT PROCESS LOT FOLLOWER

Charge # 35016 - 87258-0000

(6 WFS)

Isolation Etch	Step	Date/ Oper.	Tools	Step operation	Operation recipe	Notes
Water clean	0.1	5-15	Wet station	Dip, dry	NH4OH (2%), 30sec, DI rinse, 30sec, N2 blow dry	
HMDS Dep	1	5-15 ER	YES Oven	HMDS Dep	Program 0 ✓	
Apply resist/bake (target 2.5 um)	2	5-15 ER	Solitec Coat		Resist type 511 ✓ Spin resist 4000 RPM (3000) 30 sec. ✓ Hotplate bake 110C, 60sec ✓	
Expose Device Mask	5	5-15 ER	GCA Stepper		Mask / Reticle name ROC1 / Layer 2 Global align to 1 DFAS align to 1 Vernier align to 1 Job name \ pass 1 Develop Type: 701 Develop Time: 60 Sec.	
Develop	6	5-15 ER	Solitec DEV.			
Inspect wafers	7	5-15 ER	Optical scope	View wafers	Equipment type A O Microscope Check for patterns properly developed Check alignment (+/- 0.25um) Smallest Resolution Pattern Read (um) Acceptance: Yes, No X=0 Y=0 +1 OVERALL	X X X X
Post Bake	REL 5/16	5/16	Ovens in Lab 335	Post bake PR	90C 30min	
Descum	0.7	5/16	Branson 1	Descum	O2, 500mT, 300W, 4min	
Isolation Etch	0.8	5/16	Wet bench		MAGIC ETCH	
PR strip	0.10	5/16	Wet bench	Strip Resist Rinse Dry	Acetone soak, 10min IPA soak, 1min N2 blow	
Inspect wafers	0.11	5/16	Optical scope	View wafers		

Lot #: ROC1-4
MS2-C12 Wafer #: 21 Layer #: 2 (CO1A)

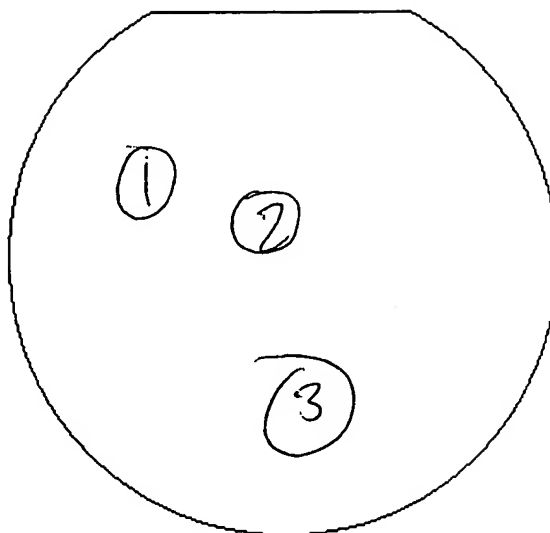
Location ①

Resolution _____

Resolution _____

Resolution _____

Resolution _____



Location ②

Resolution _____

Resolution _____

Resolution _____

Resolution _____

AVG. X ← .1
 AVG. Y ↑ .15

☐ Rework
☒ Accept

Initial AB

Location _____

Resolution fail

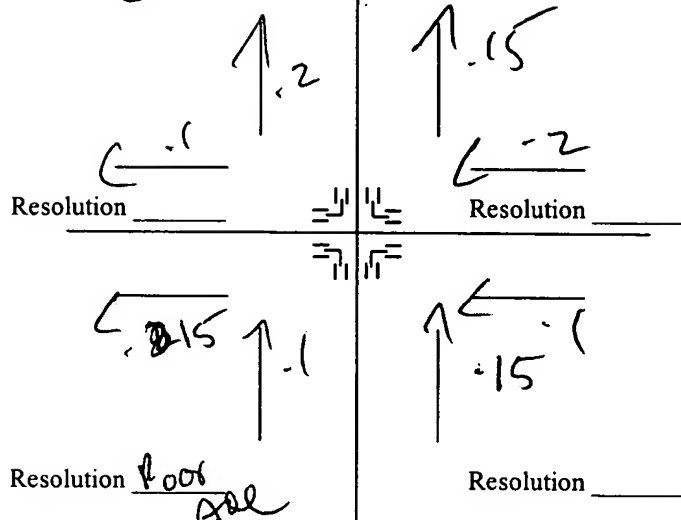
Resolution pass

Resolution _____

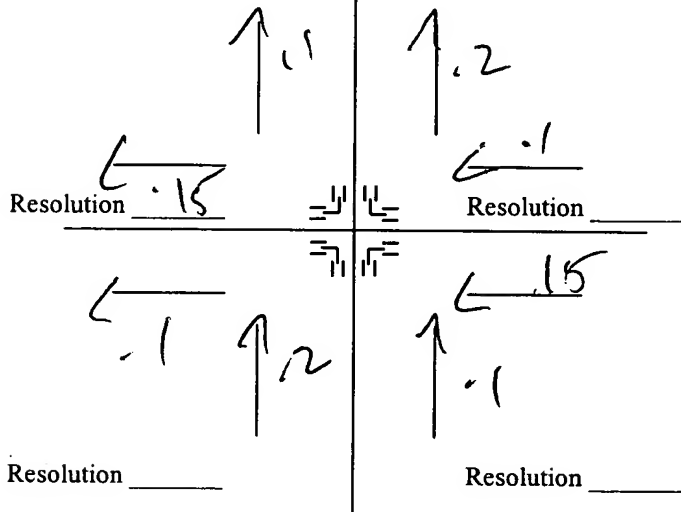
Resolution _____

Lot #: 2001-4 Wafer #: 27 Layer #: 2

Location ①



Location ②

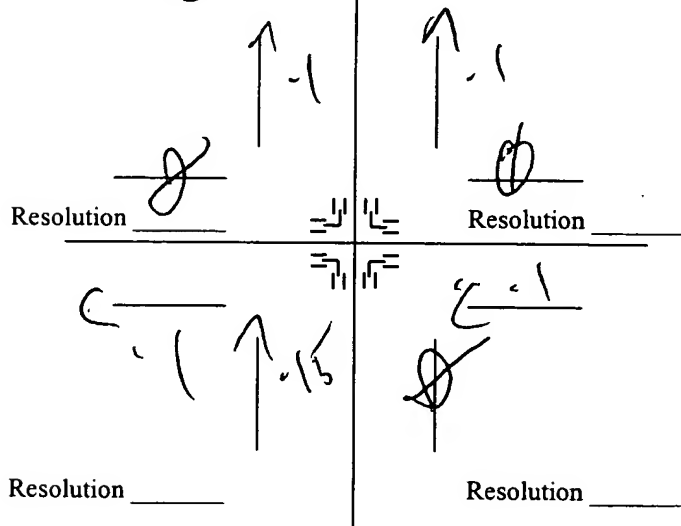


AVG. X .1
AVG. Y .1

☐ Rework
☒ Accept

Initial RP

Location ③



Lot #: _____ Wafer #: _____ Layer #: _____

Location _____

Resolution _____

Resolution _____

Resolution _____

Resolution _____

Location _____

Resolution _____

Resolution _____

Resolution _____

Resolution _____

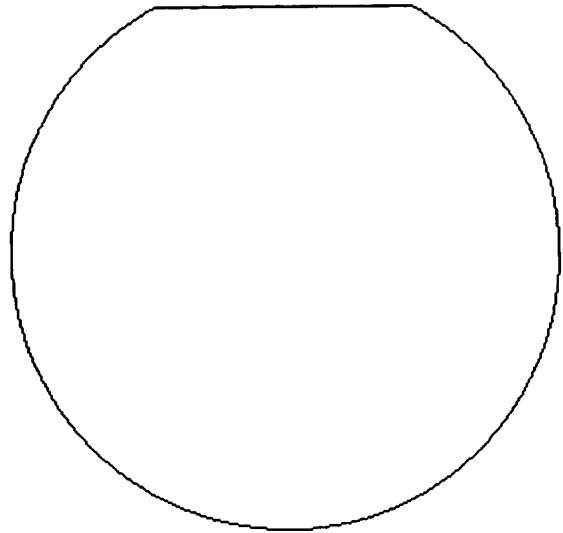
Location _____

Resolution _____

Resolution _____

Resolution _____

Resolution _____



AVG. X _____

AVG. Y _____

- ☐ Rework
☐ Accept

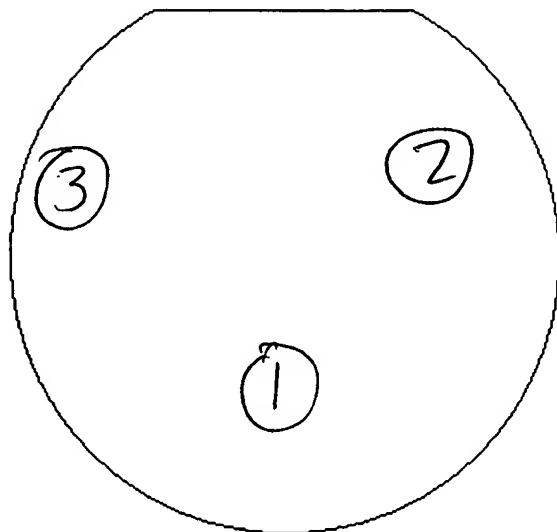
Initial _____

Lot #: 2001-4 Wafer #: 22 Layer #: 2

Location ①

Resolution 0.1 0.1 Resolution 0.1

Resolution 0.1 0.5 Resolution 0.2 0.1



Location ②

Resolution 0.1 0.1 Resolution 0.1

Resolution 0.1 0.15 Resolution 0.1 0.15

AVG. X 0.1
AVG. Y 0.05

☐ Rework
☒ Accept

Initial MD

Location ③

Resolution 0.1 0.1 Resolution 0.1 0.1

Resolution 0.15 0.15 Resolution 0.15 0.15

Location 0

Resolution 2

Resolution

Resolution _____

Resolution Four
Both

Location 2

Resolution _____

Resolution

Resolution _____

Resolution

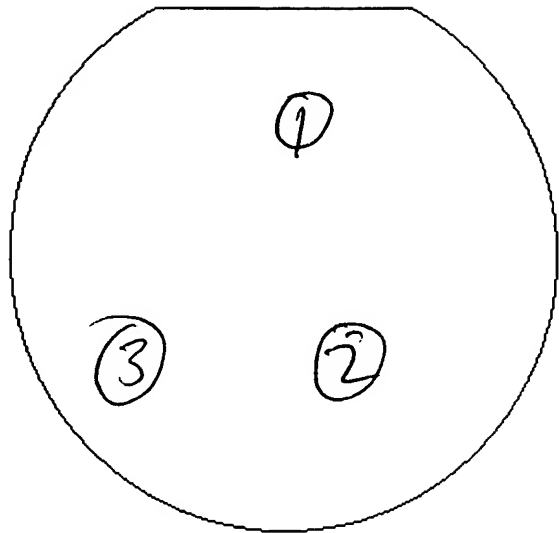
Location _____

Resolution _____

Resolution

Resolution _____

Resolution



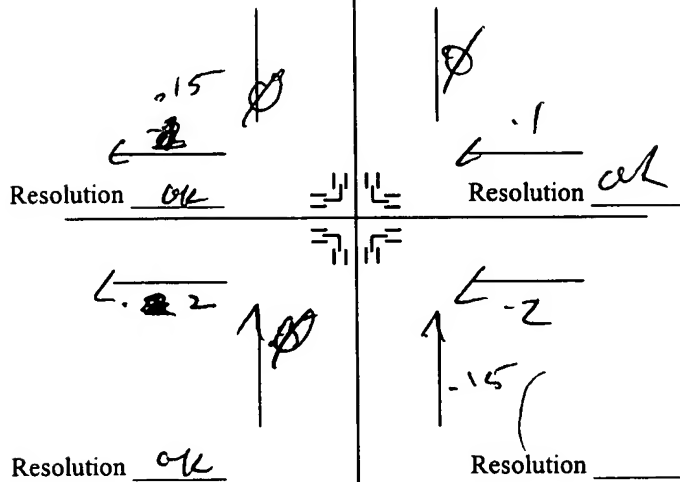
AVG. X	$\frac{1}{2}$
AVG. Y	$\frac{1}{2}$

☐ Rework
☒ Accept

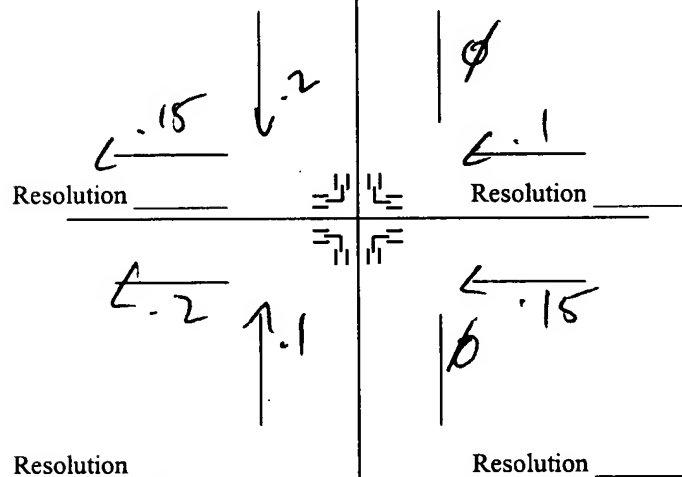
Initial KP

Lot #: 2001-4 Wafer #: NO NUM Layer #: 2

Location (1)



Location (2)



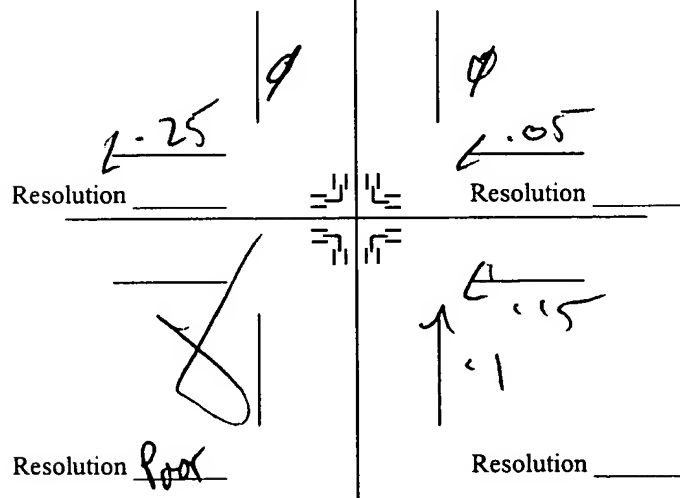
AVG. X 0.15
AVG. Y 0.15

☐ Rework
☒ Accept

Initial VP

Res over exposed
A bit

Location (3)



Resolution Poor
Boh

Step 1 solder

Wafer 022[illegible]

Comments and Pictures:

approximate subcollector thickness: 200
thickness etched in base ped : 0
target thickness : 200
+ 3800 In? for H₁

Charge # 35016 - 87258-0000
Lot # Roc 1-4A

Wafer 21 D4BT

[illegible]

Comments and Pictures:

Attachment 3
Page 40 of 68

200Å InGaAs
3800Å InP

Wafer 27 ST/BT^{lnP} HBT PROCESS LOT FOLLOWER Step 1 So

[illegible]

Comments and Pictures:

~~500 Å~~ 4000 Å InGaAs

Wafer B3B4 B3B3 InP HBT PROCESS LOT FOLLOWER Charge # 35016-87258-0000
D+HBT Step Isolation Lot # ROC1-4A

Etch Time	Etchant	Ref THK	DEKTAK	Etch Amount	Etch Rate
#1 10sec	1:8:160	≈ 10,830			
15sec	HCl		14,300	Total = 3470	
add 6sec	HCl		14,475		
#2 10sec	1:8:160	10,830			
15sec	HCl		13,600	Total = 2770	
add 15sec	HCl		15,355		
Comments and Pictures:					

200 InGaAs
 3800 InP

Rockwell Science Center

InP HBT PROCESS LOT FOLLOWER

Charge # 35016 - 87258-0000

BCB SPIN	Wafers in	Wafers Out	Tools	Step operation	Operation recipe	Operator/ Dat
ADD 3" M chemical Test Wafer.						
Wafer Clean	6	6	Wet Station	Dip Rinse Dry	: NH4OH 2 % 15 sec : DI Dump Rinse : Spin Dryer	5/25 Judi
BCB Adhesion promoter	6	6	Headway Resist Coater	Promoter type Spin Promoter	APS 3000 500rpm, 10s + 1500rpm, 20s	Judi
BCB Dep	6	6	Headway Resist Coater	BCB type Spin BCB Hot Plate Bake	DOW 3022-35 (Must be at room temp.) 500 rpm, 10s + 1500rpm, 20s 70C 90sec	Judi
BCB Bake	6	6	Oven in Rm307	Bake 100C Ramp 210C Bake 210C	15min No greater than 10C/min 180 min	Judi
Planarization etch back	6	6	UnAxis 790	790 etch Parameters CHF3: 40 sccm 4047 O2: 10 sccm 120W	HBT_BCB2 Time 22:30 Etch Rate: 4.4A/sec 6600A	5/29 Sung
Inspect wafers	6	6	Optical scope	View wafers	Equipment type A O Microscope Check for patterns BCB is clear Acceptance: Yes, No Ellipsometer reading:	5/29

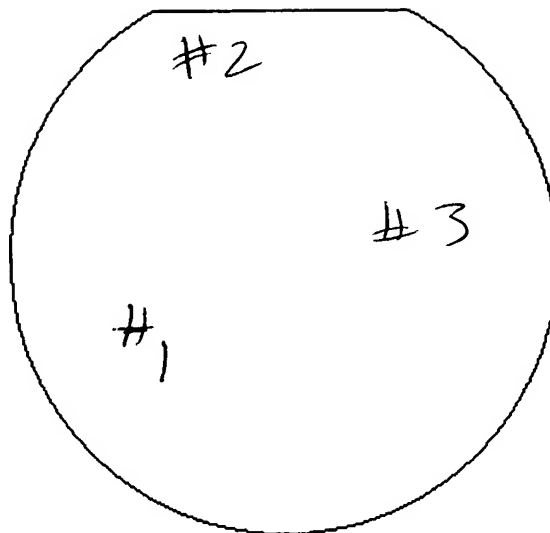
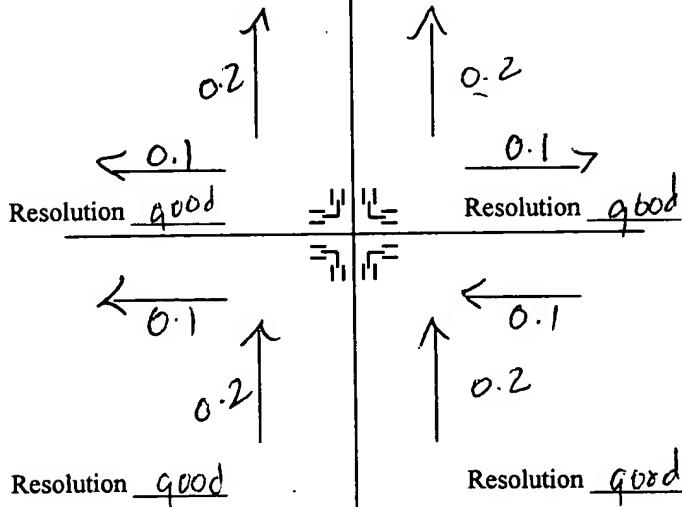
Judi - I forgot about the mechanical wafer again. Please ask Scott for one or find me.

- Anal

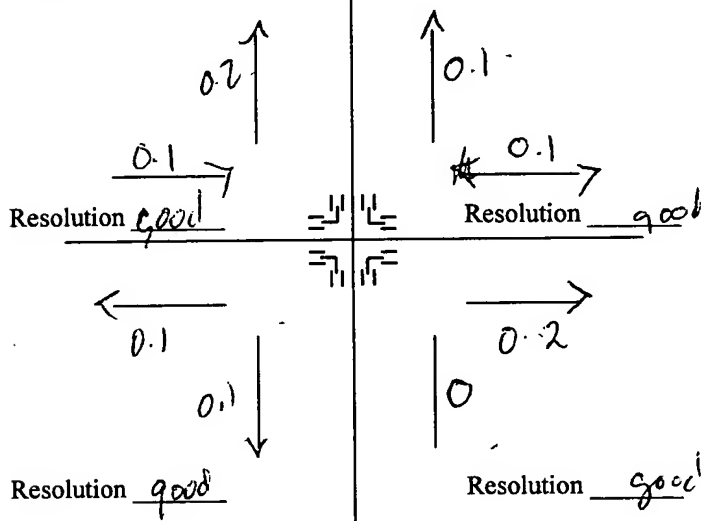
test wafer added.

Lot #: R0C1 Wt4A Wafer #: 22 Layer #: 26

Location 1



Location 2

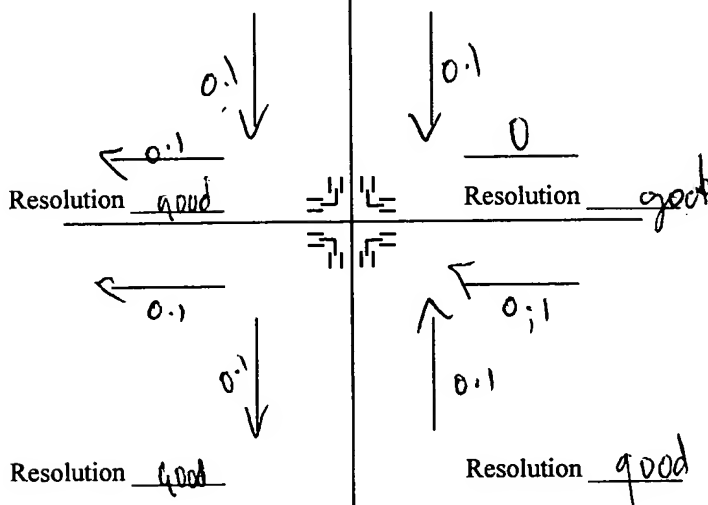


AVG. X 0.2
AVG. Y 0.1

☐ Rework
☒ Accept

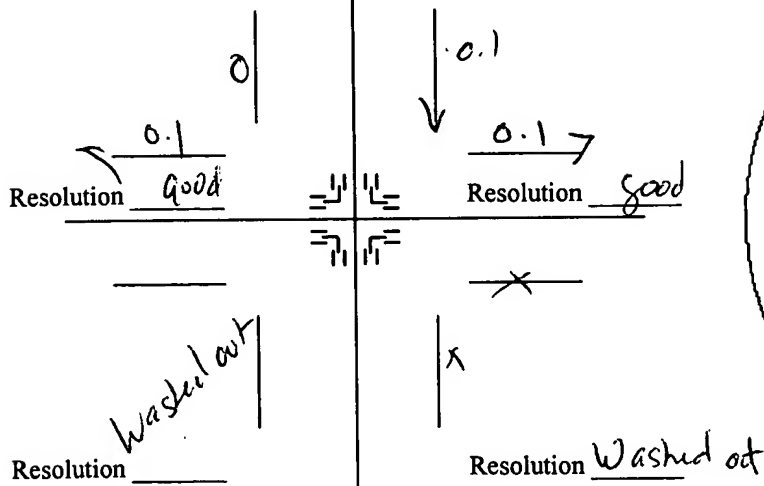
Initial jud

Location 3

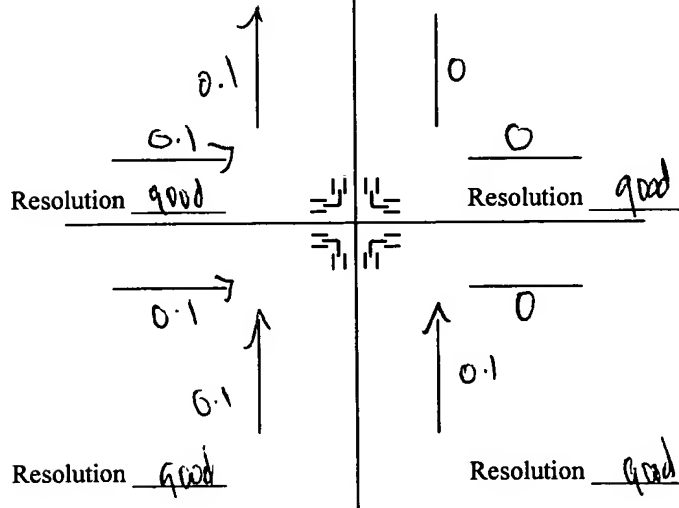


Lot #: Ra1 L4A Wafer #: ? Layer #: 26

Location 1



Location 2

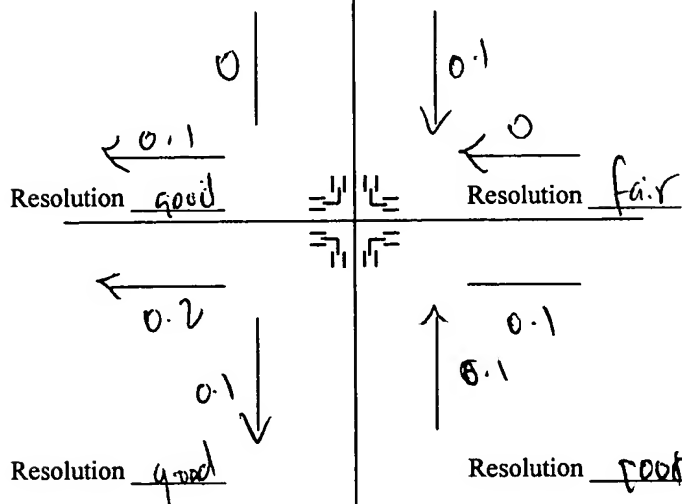


AVG. X 0.1
AVG. Y 0.1

☐ Rework
☒ Accept

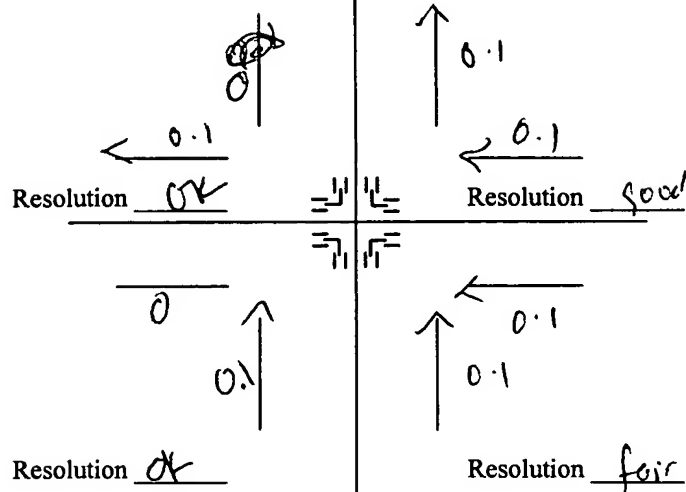
Initial Jvd.

Location 3

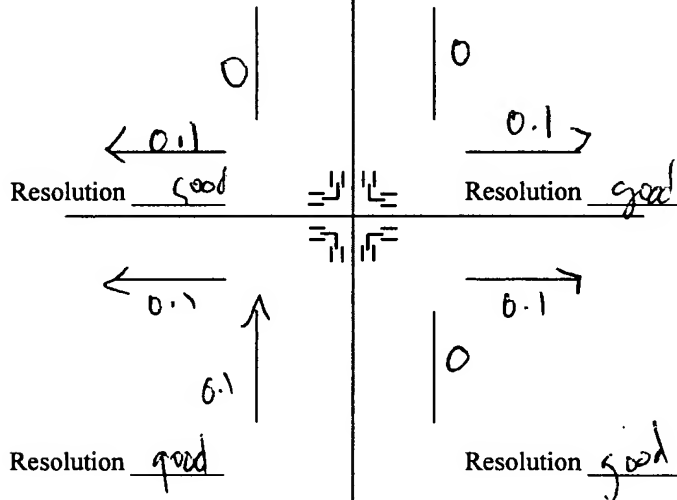


Lot #: Poc1 L4A Wafer #: ? Layer #: 26

Location 1



Location 2

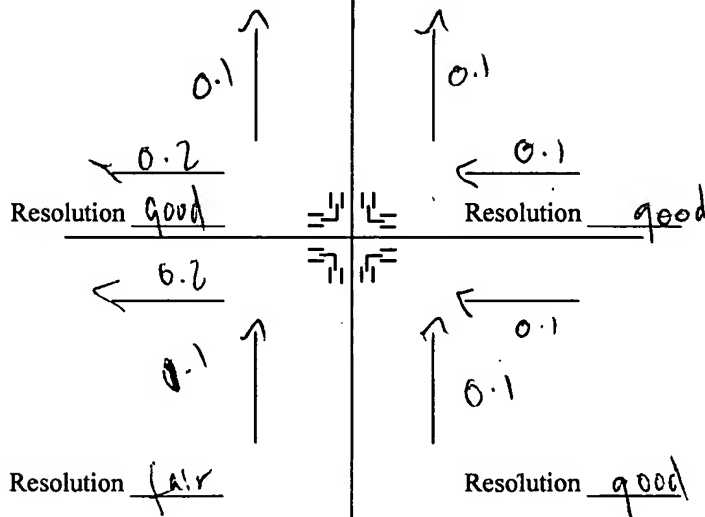


AVG. X .1
AVG. Y .1

☐ Rework
☒ Accept

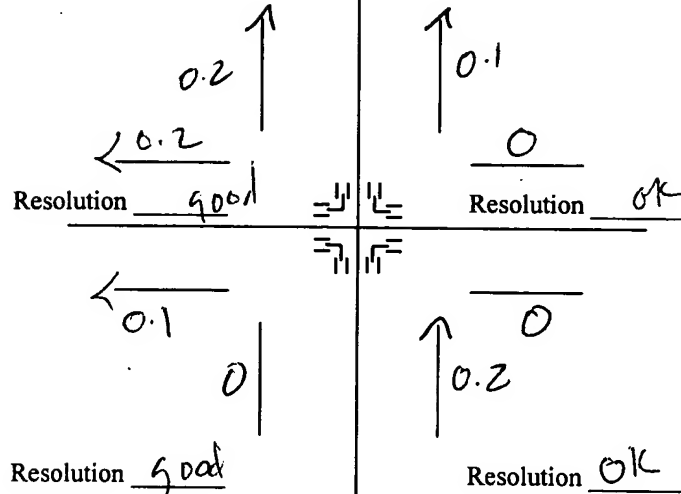
Initial sch

Location 3

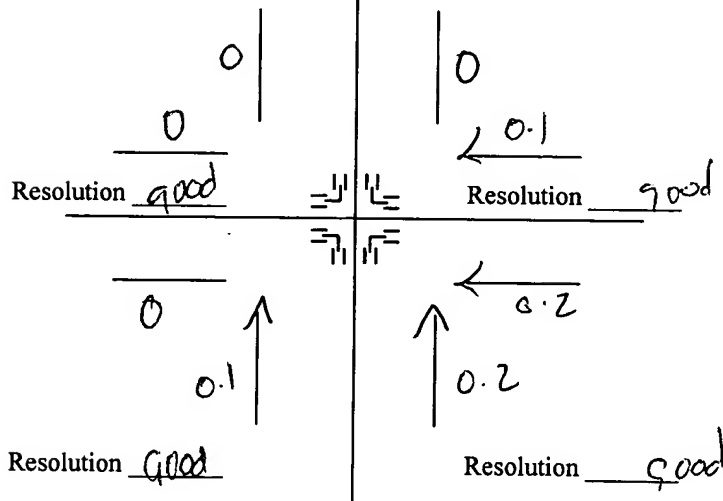


Lot #: 20C-1 L4A Wafer #: 27 Layer #: 26

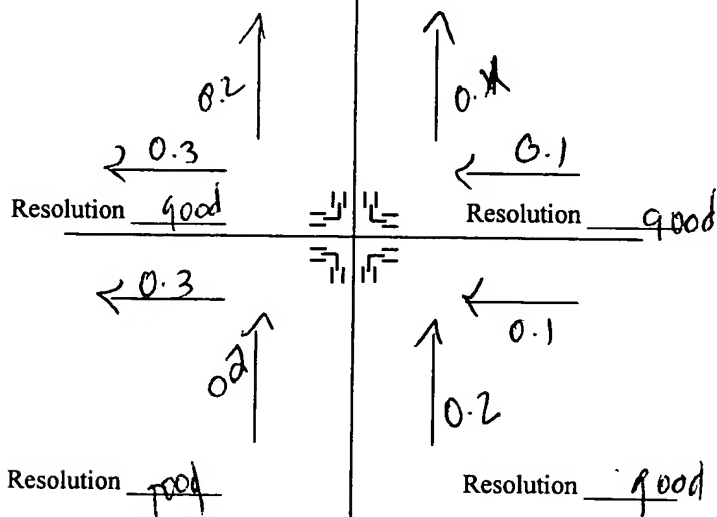
Location 1



Location 2

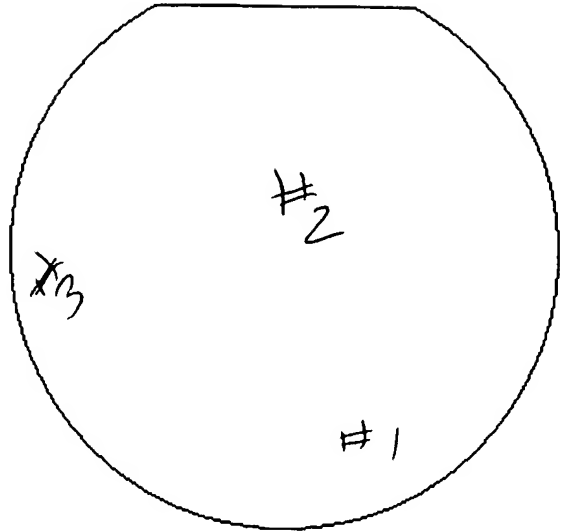
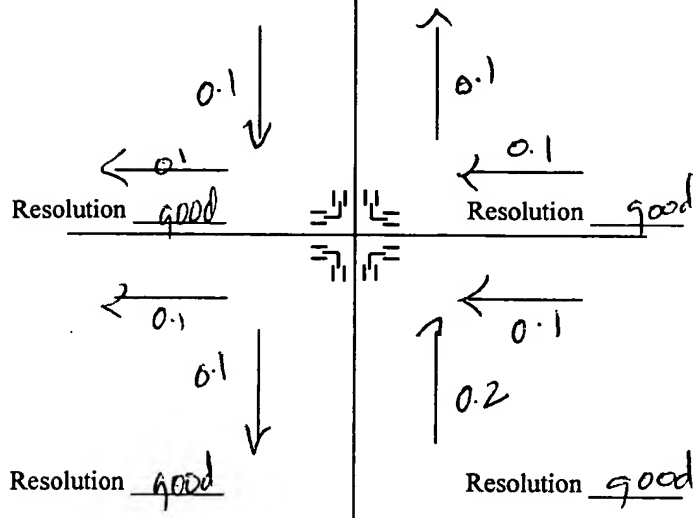


Location 3

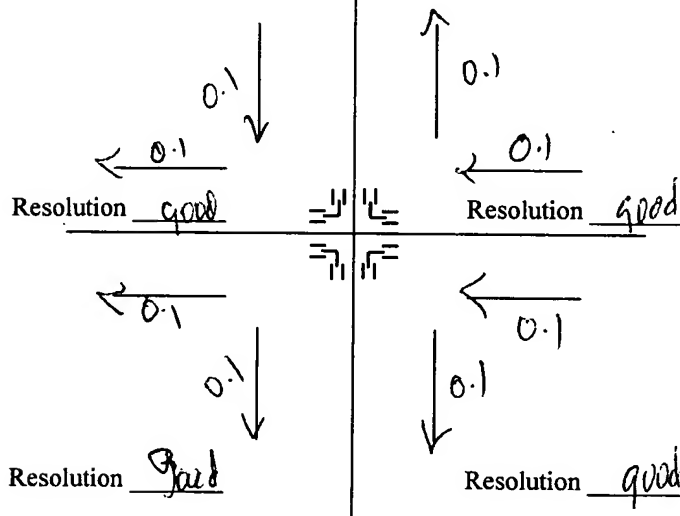


Lot #: Pod W47 Wafer #: 21 Layer #: 26

Location 1



Location 2

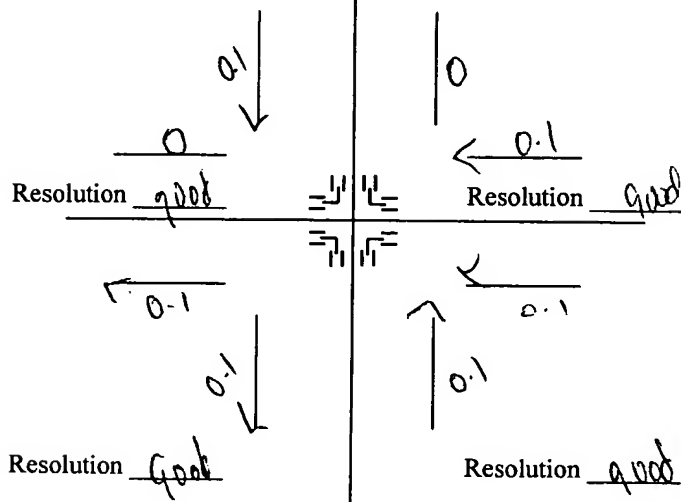


AVG. X .1
AVG. Y .1

☐ Rework
☒ Accept

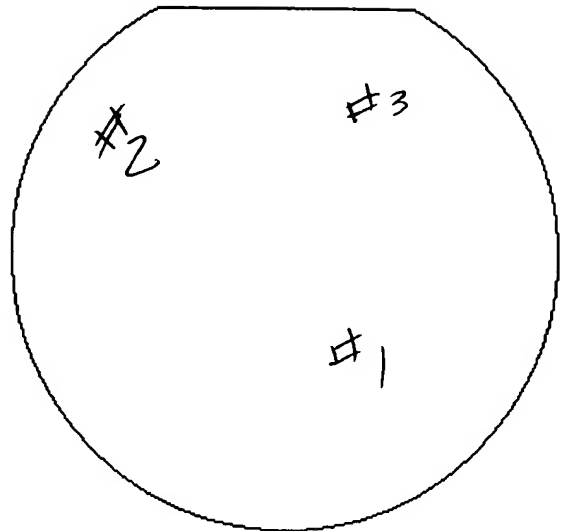
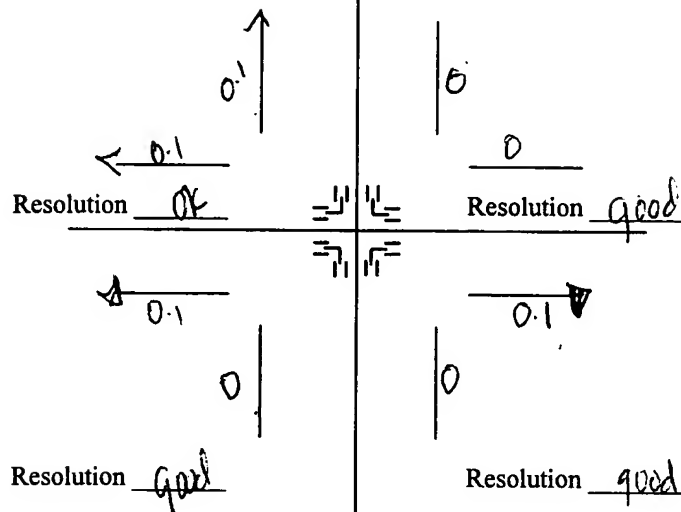
Initial ja

Location 3

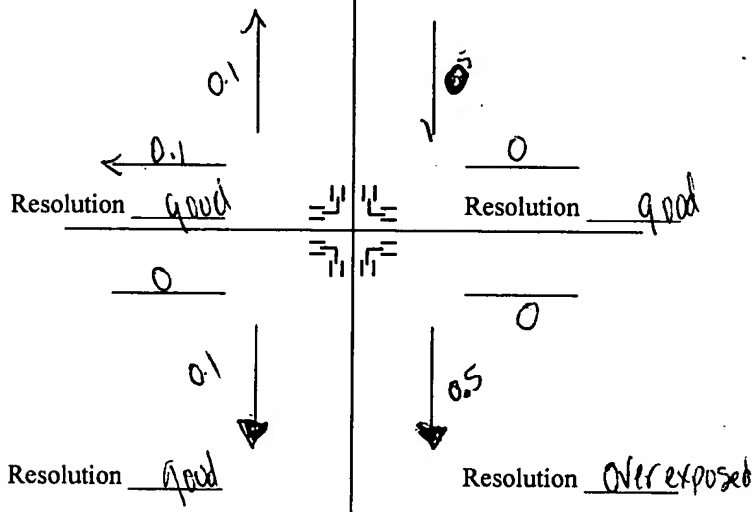


Lot #: Boc 1 4A Wafer #: _____ Layer #: 26

Location 1



Location 2

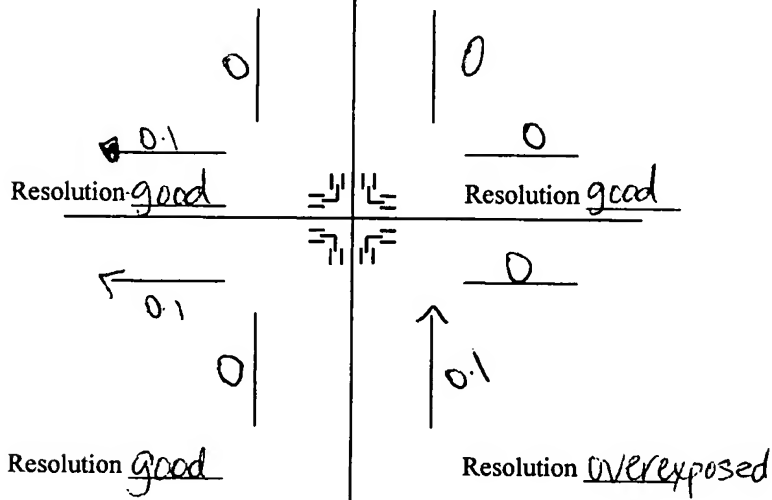


AVG. X 0.1
AVG. Y 0.0

☐ Rework
☒ Accept

Initial ASJ jud.

Location 3



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Charge # 35016 - 87258-0000

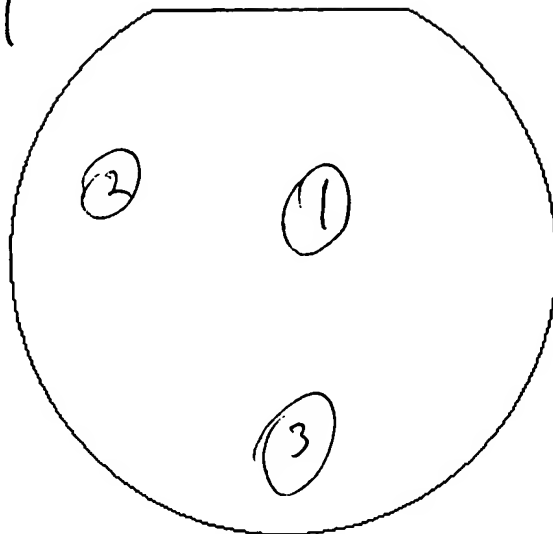
414" Test

BCB Base Via Etch	Wafers In	Wafers Out	Tools	Step operation	Operation recipe	Operat r/ Date
HMDS Dep	6		YES Oven	HMDS Dep	Program 0 ✓	5-30 PH
Apply resist/bake	7	7	Solitec Coat	4000 RPM - 30 sec Resist type 511 ✓ HOTPLATE 110C - 60 SEC		5-30 ER
Expose Device Mask	7	7	GCA Stepper	Mask / Reticle name Global align to 1 DFAS align to 1 Vernier align to 1 Job name \ pass MAP ROC11.4M.26	ROC1 / Layer 26	
Develop	7	7	Solitec DEV.	Develop Type: 701 ✓ Develop Time: 60 Sec. ✓		5-30 ER
Inspect wafers	7	7	Optical scope	View wafers Equipment type A O Microscope ✓ Check for patterns properly developed ✓ Check alignment (+/- 0.2µm) - 1 OVERALL ✓ Smallest Resolution Pattern Read .7 (µm) Acceptance: Yes ✓, No		5-30 ER
Etch Rate	7	7	Unaxis 790 Dektak/Ellipsometer	Program: HBT_BCB Time: 15 min 9600 THK(A) + 30% over etch 1067 A/s		5/31 Sat
BCB Via Etch	7	6	Unaxis 790	Program: HBT_BCB Time: 15 min 7400 + over etch		5/31 Sat
Inspection	6	6	Optical scope	View wafers		5/31 Sat
PR Descum Etch	8	6	Unaxis 790 Dektak	Program HBT_PR 525		5/31 Sat
PR strip	6	6	Wet bench	Strip Resist Rinse Dry	Acetone soak, 10min IPA soak, 1min N2 blow	5/31 Sat
Inspect wafers	6	6	Optical scope	View wafers		5/31 Sat

Lot #: ROC-4 Wafer #: No# Layer #: 25

Location 1

Resolution OK 3 1 0 Good
3 2 0 Fair
Resolution OK Resolution Fair



Location 2

Resolution OK 1 2 0.5 Fair
1.5 2.5 0.1 Good
Resolution Fair Resolution Good

AVG. X 2
AVG. Y 2

☐ Rework
☒ Accept

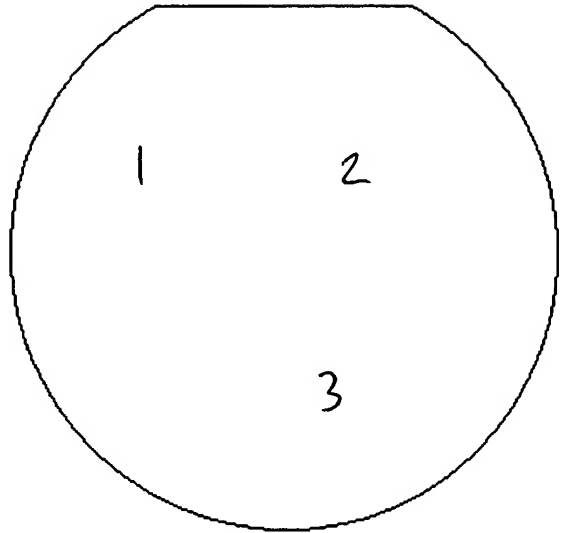
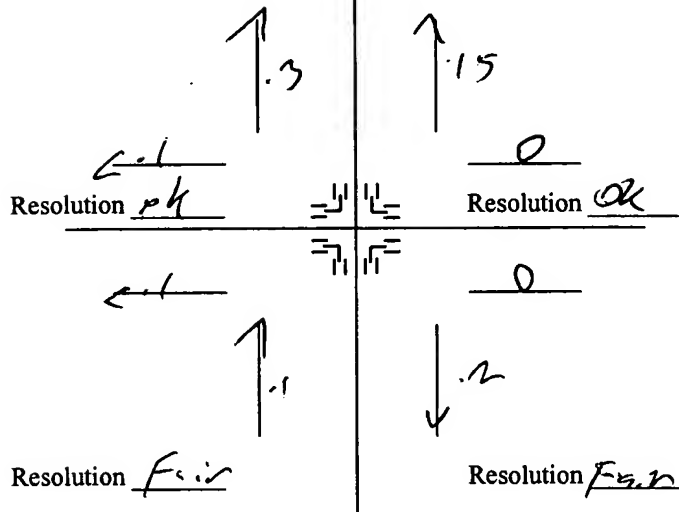
Initial Sort

Location 3

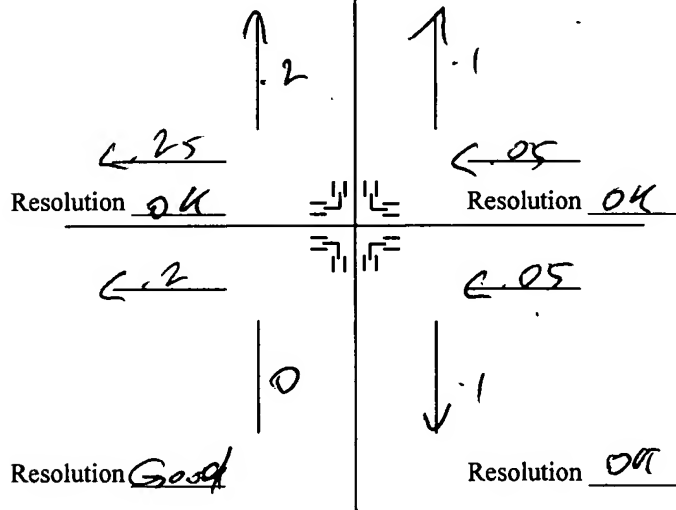
Resolution Fair 2 1 1 Fair
2.5 0.5 0 Good
Resolution Good Resolution Good

Lot #: R0C1-4 Wafer #: 27 Layer #: 25

Location 1



Location 2

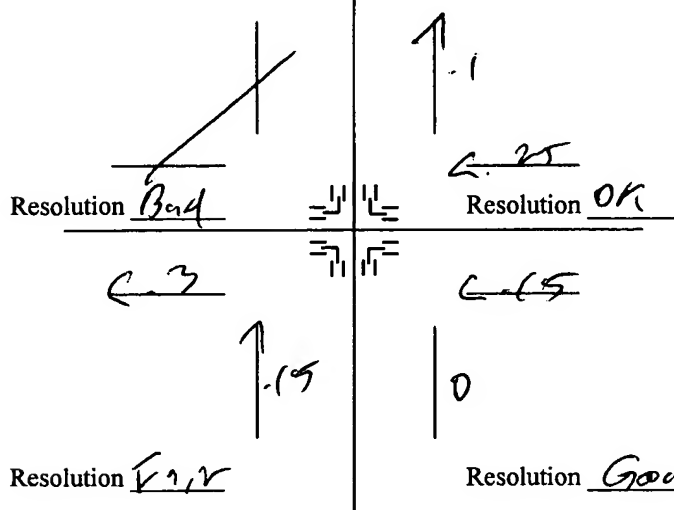


AVG. X .2
AVG. Y .15

☐ Rework
☒ Accept

Initial Smt

Location _____



Rockwell Science Center

InP HBT PROCESS LOT FOLLOWER

Charge # 35016 - 87258-0000

(6 wfs)

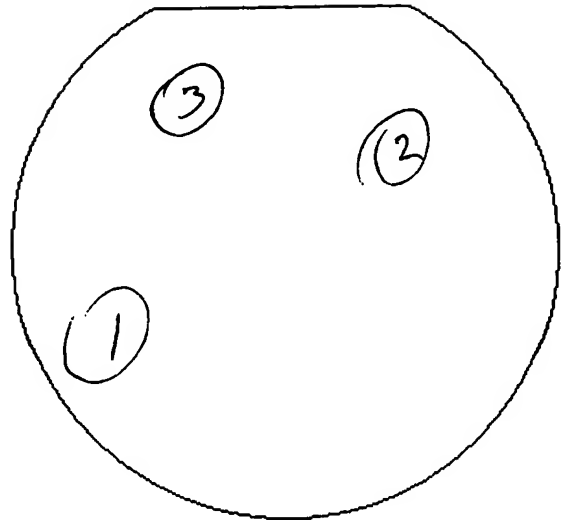
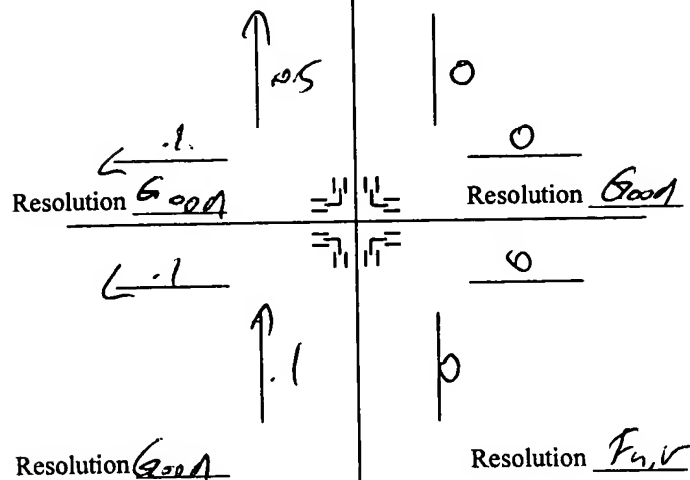
BCB C llect r Via Etch	Wafers In	Wafers Out	Tools	Step operation	Operation recipe	Operator/ Date
HMDS Dep	6	6	YES Oven	HMDS Dep	Program 0 ✓	6-1-01 PM
Apply resist/bake	6	6	Solitec Coat	Resist type 518 ✓ 3500 RPM - 30 sec HMDS 110C - 60 sec		6-1-01 ER
Expose Device Mask	6	6	GCA Stepper	Mask / Reticle name ROC1 / Layer 25 Global align to 1 DFAS align to 1 Vernier align to 1 Job name \ pass MAP ROC11.4M,25 Develop Type: 701 Develop Time: 60 Sec..	EXP .85	
Develop	6	6	Solitec DEV.	View wafers	Equipment type A O Microscope Check for patterns properly developed Check alignment (+/- 0.35µm) Smallest Resolution Pattern Read - 8 (µm) Acceptance : Yes , No	6/3 X = .1 Y = .1 Z = .1
Inspect wafers	6	6	Optical scope	Unaxis 790 Dektak/Ellipsometer	Program: HBT_BCB Time: 45 min 8850 THK(A) 983 A/s	6/5 5/5 5/5
Etch Rate	6	6	Unaxis 790	Program : HBT_BCB Time: 2.5		6/5 5/5
BCB Via Etch	6	6	Optical scope	View wafers		6/5 5/5
Inspection	6	1	Wet bench	Strip Resist Rinse Dry	Acetone soak, 10min IPA soak, 1min N2 blow	6/5 5/5
PR strip	6	1	Optical scope	View wafers		6/5 5/5
Inspect wafers	6	6	Optical scope	View wafers		6/5 5/5

Lot # ROC1-4

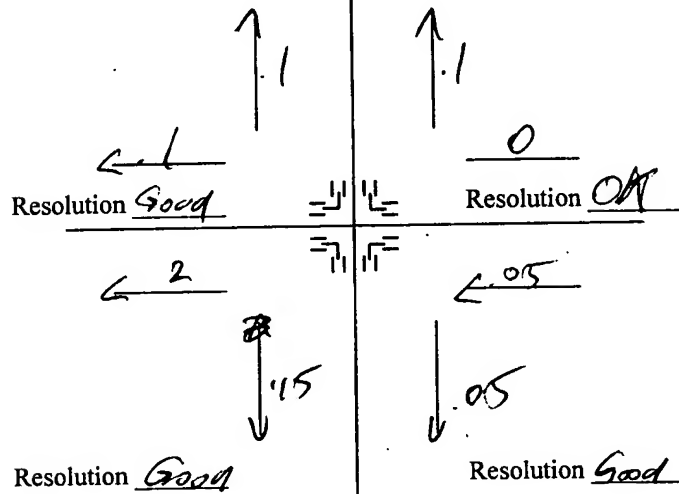
Wafer #: 25

Layer #: 25

Location 1



Location 2

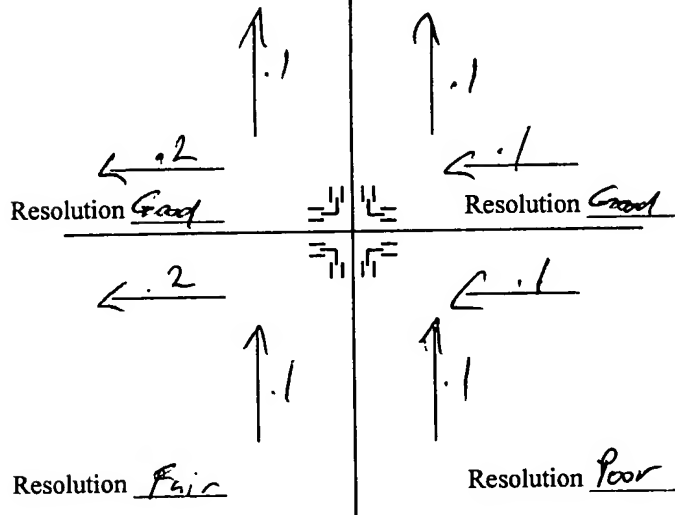


AVG. X 0.1
AVG. Y 0.1

☐ Rework
☒ Accept

Initial del S.N.

Location 3



SMN 5/8/01

Lot #: ROC1-4 Wafer #: W0# Layer #: 25

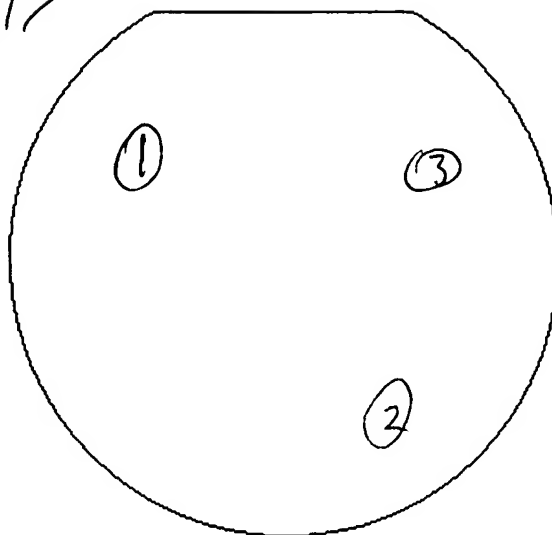
Location 1

Resolution Good

Resolution OK

Resolution Par

Resolution OK



Location 2

Resolution Good

Resolution Good

Resolution Fair

Resolution OK

Avg x ← 0.1

Avg y 0.21

☐ Rework

☒ Accept

Initials S.N.

Location 3

Resolution Fair

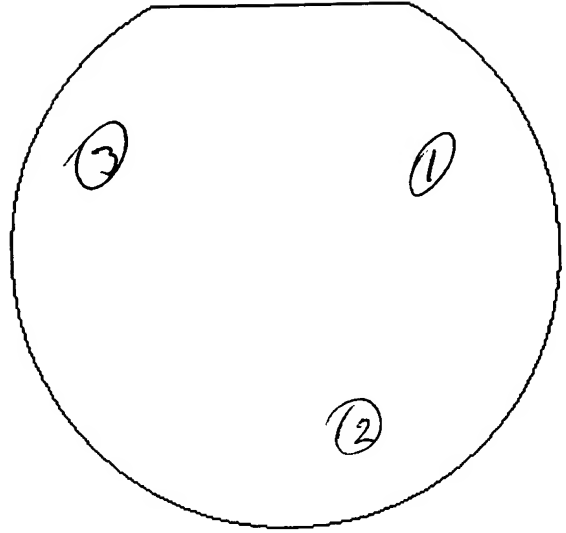
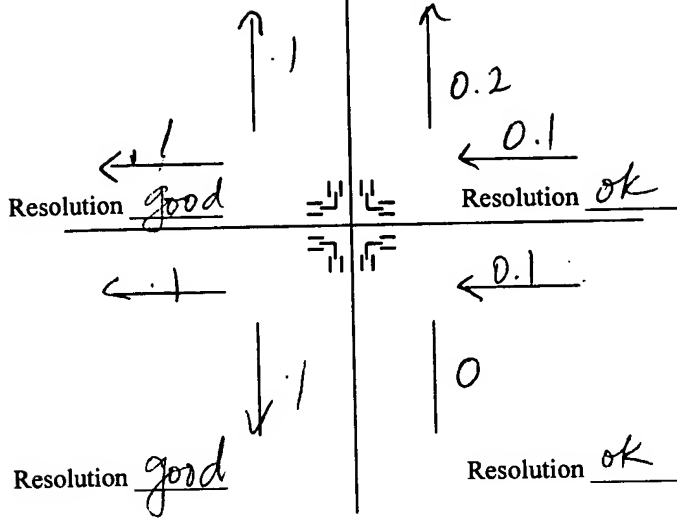
Resolution Bad

Resolution Good

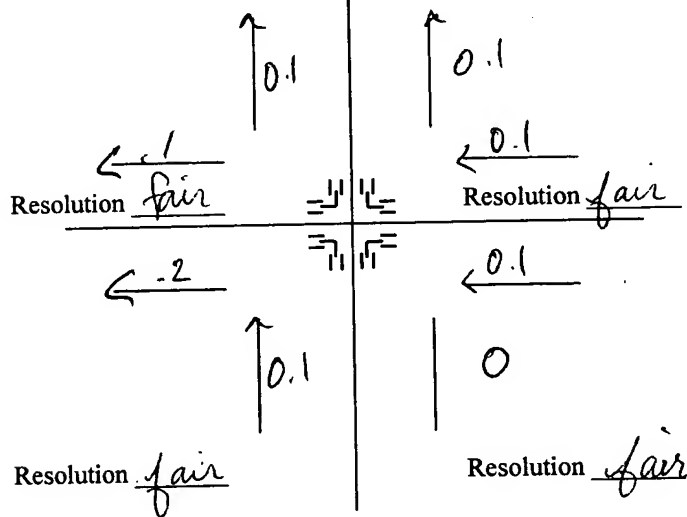
Resolution Fair

Lot #: R0C1-4 Wafer #: 22 Layer #: 25

Location 1



Location 2



Avg x 0.1

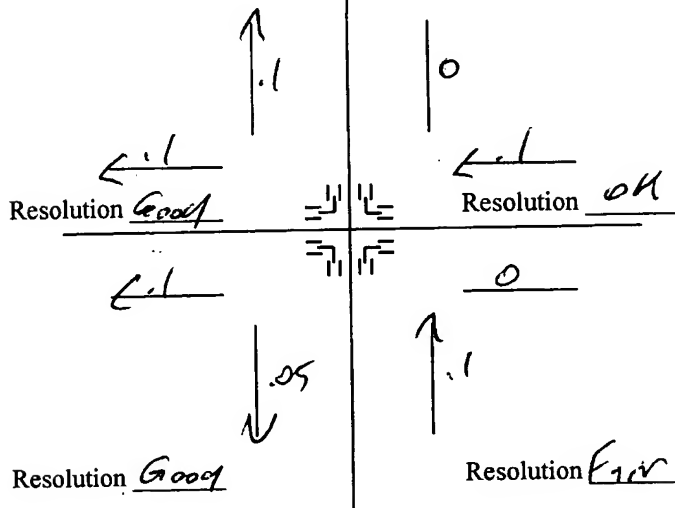
Avg y 0.1

☐ Rework

☒ Accept

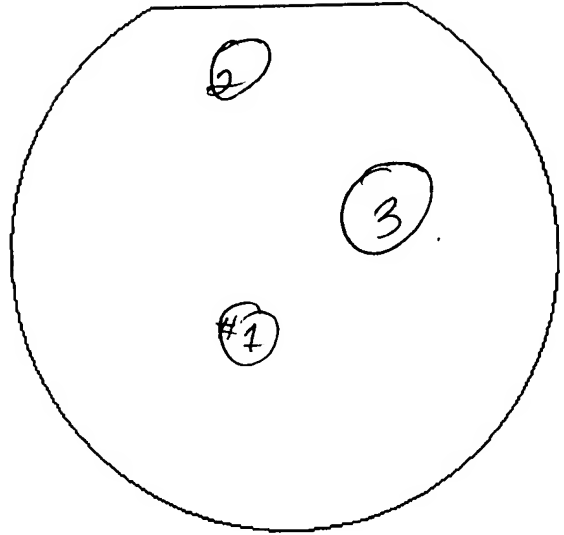
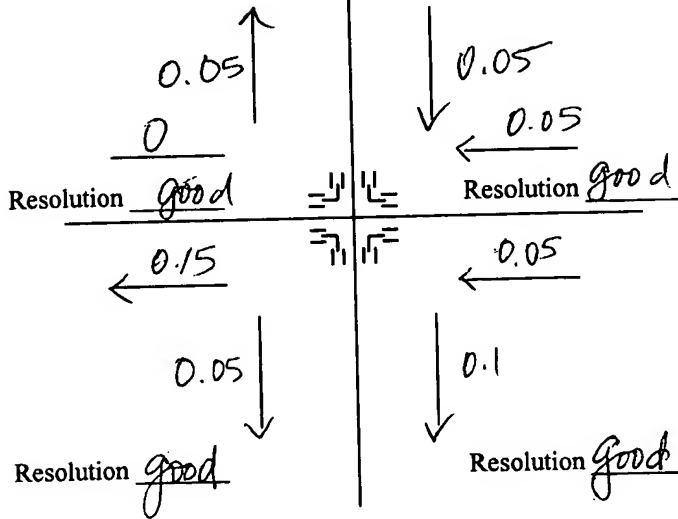
Initial g.l. S.N.

Location 3

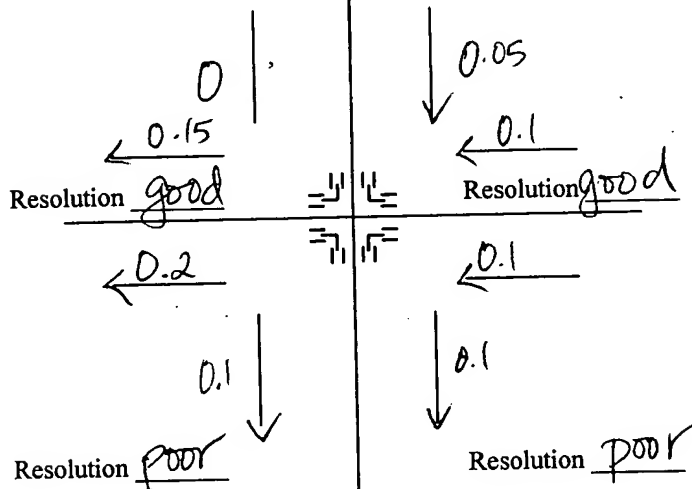


Lot #: ROC1-4 Wafer #: 21 Layer #: 25

Location 1



Location 2



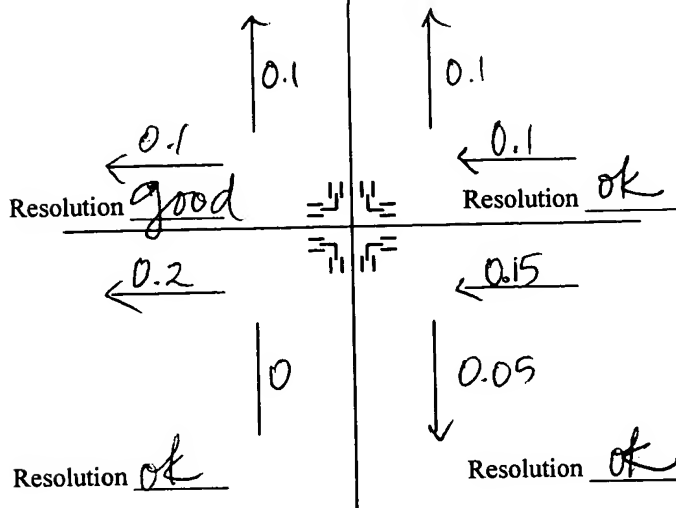
Avg x ← 0.1
Avg y 0.05 ↑

Rework ☐

Accept ☒

Initial A.J. S.N.

Location 3



Wafer # 22XT

Resist moves
 Left +
 Up +

Wafer Flat

←	X	X	←
↓	Y	Y	↓
←	X	X	←
↓	Y	Y	↓

Left 9 Right

←	X	X	←
↓	Y	Y	↓
←	X	X	←
↓	Y	Y	↓

+ 0 Y Y 1 ↑

Wafer # 22XT

Wafer Flat

←	X	X	0
↑	Y	Y	1
0	X	X	1
↓	Y	Y	2

Left 2 Right

0	X	X	0
↓	Y	Y	1
0	X	X	0
↓	Y	Y	0

+ 2 Y Y 0

Wafer # ?

Wafer Flat

0	X	X	1
↑	2	Y	Y
0	X	X	2
?	Y	Y	2

Left ? Right

←	X	X	1
↓	2	Y	Y
←	X	X	2
↓	Y	Y	2

+ 1 2 Y Y 2 ↑

Wafer # 25XT

Wafer Flat

0	X	X	1
↑	Y	Y	1
0	X	X	0
↓	Y	Y	1

Left 1 Right

0	X	X	0
↓	2	Y	Y
0	X	X	1
↓	Y	Y	1

+ 1 Y Y 1 ↑

Wafer # 21XT

Wafer Flat

0	X	X	0
0	Y	Y	0
0	X	X	0
↓	Y	Y	0

Left 1 Right

0	X	X	0
0	Y	Y	0
0	X	X	0
0	Y	Y	0

+ 0 Y Y 0

Wafer # ?

Wafer Flat

0	X	X	1
↑	Y	Y	1
0	X	X	1
0	Y	Y	0

Left 0 Right

←	X	X	1
↓	2	Y	Y
←	X	X	1
↓	Y	Y	2

+ 1 Y Y 2 ↑

Wafer #

Wafer Flat

X	X
Y	Y
X	X
Y	Y

Left Y Right

X	X
Y	Y
X	X
Y	Y

+ Y Y

Wafer #

Wafer Flat

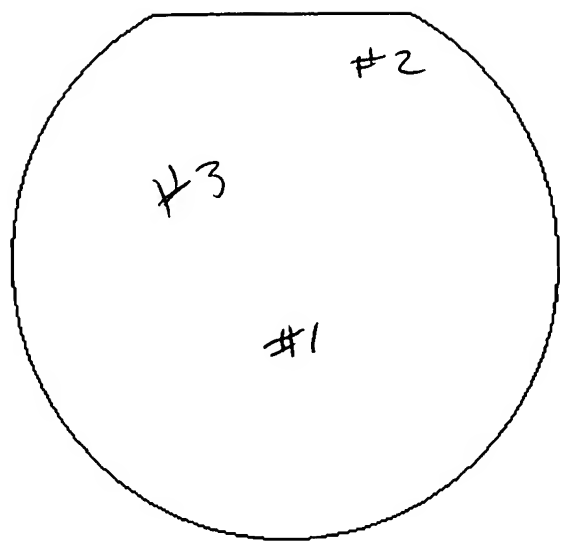
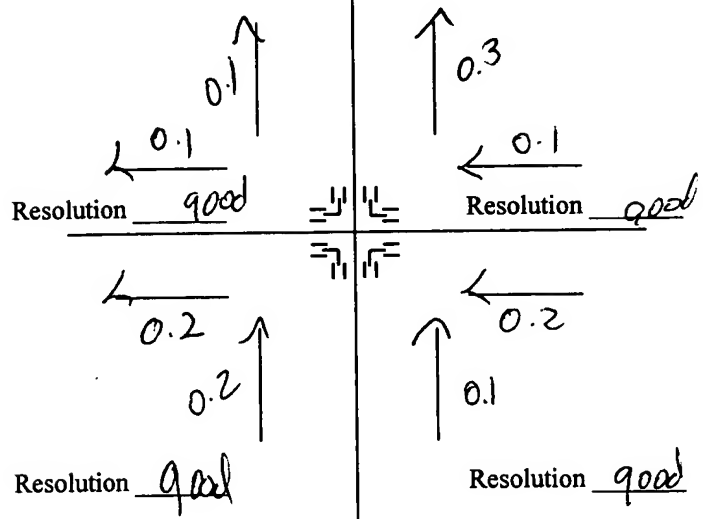
X	X
Y	Y
X	X
Y	Y

Left Y Right

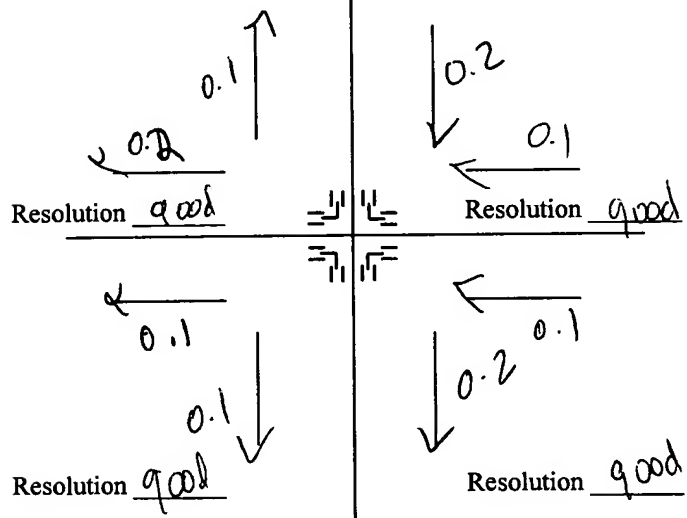
X	X
Y	Y
X	X
Y	Y

+ Y Y

Location #1



Location #2

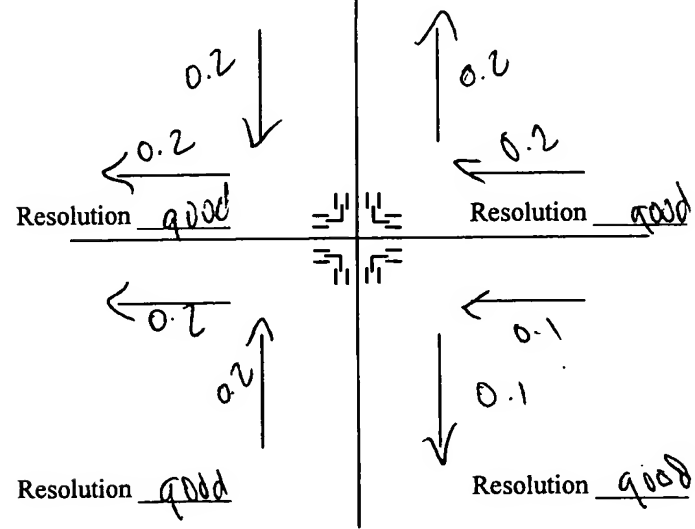


AVG. X 0.2
AVG. Y 0.2

- ☐ Rework
- ☐ Accept

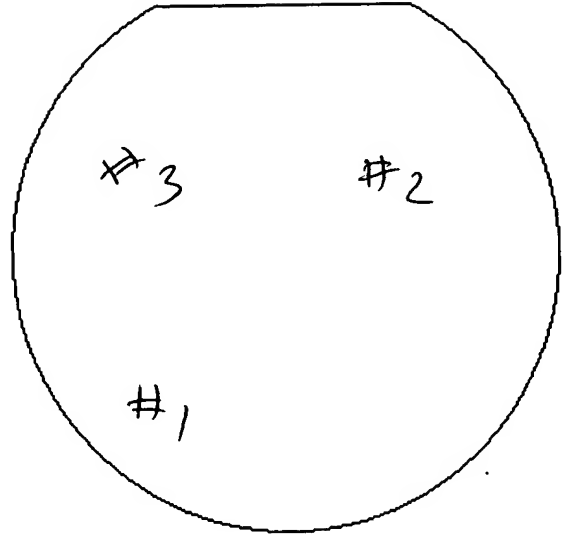
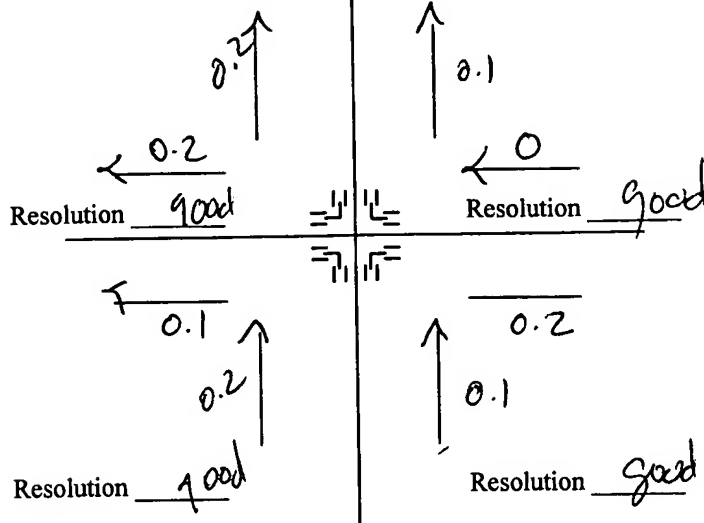
Initial [Signature]

Location #3

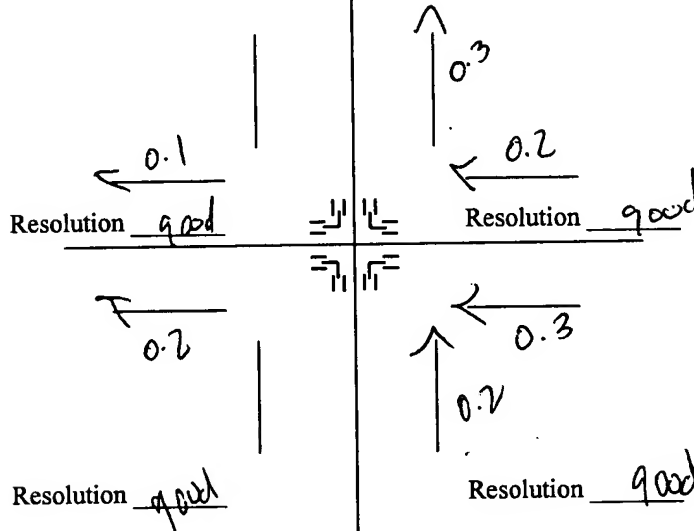


#1 Lot #: Roll 4A Wafer #: 21 Layer #: 9

Location _____



Location #2

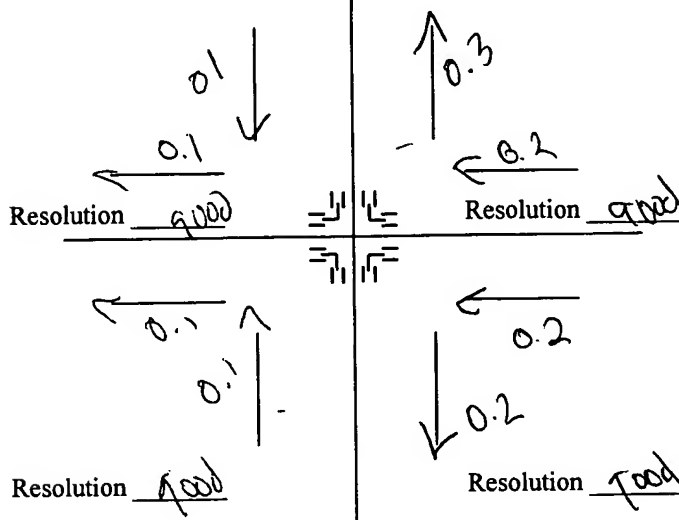


AVG. X 0.2
AVG. Y 0.2

☐ Rework
☐ Accept

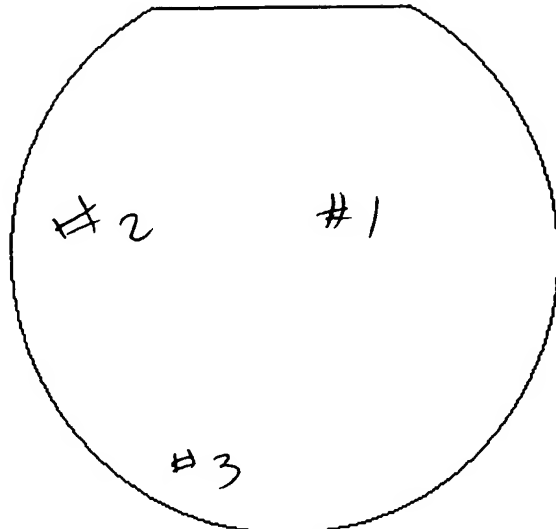
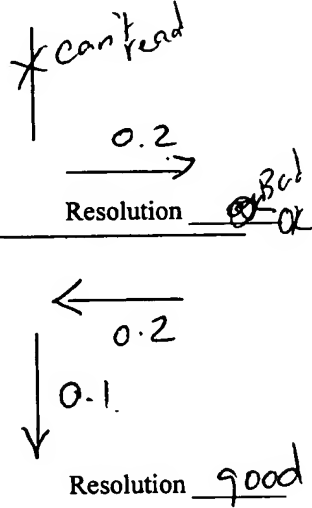
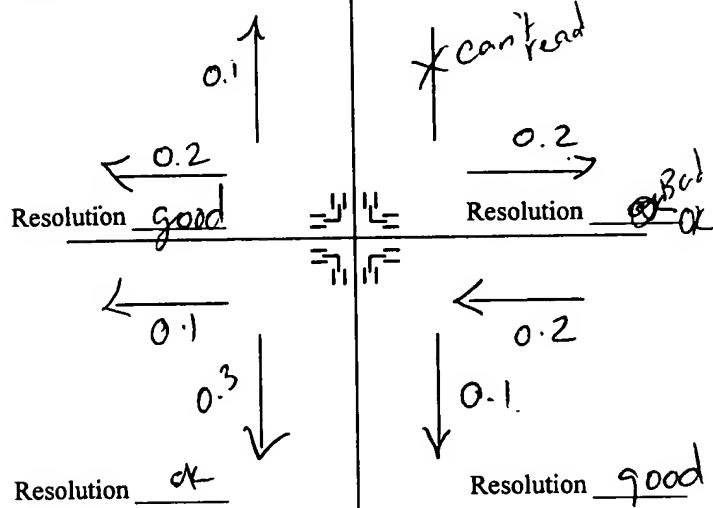
Initial ju

Location #3

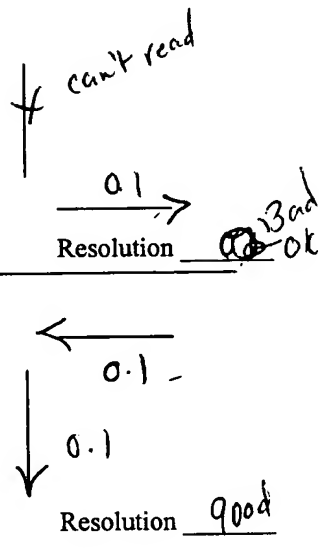
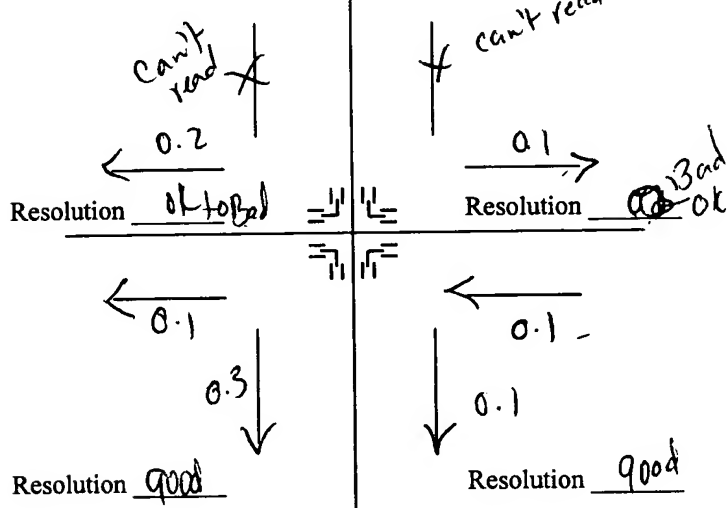


#1 Lot #: RUC1-4A Wafer #: 22 Layer #: 9

Location _____



#2
Location _____

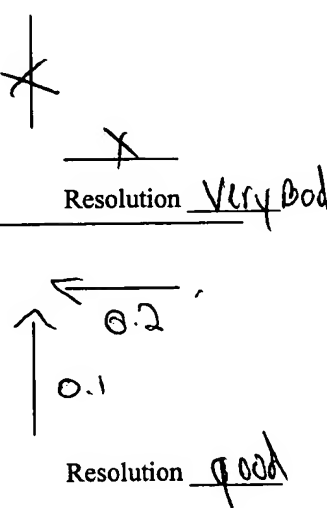
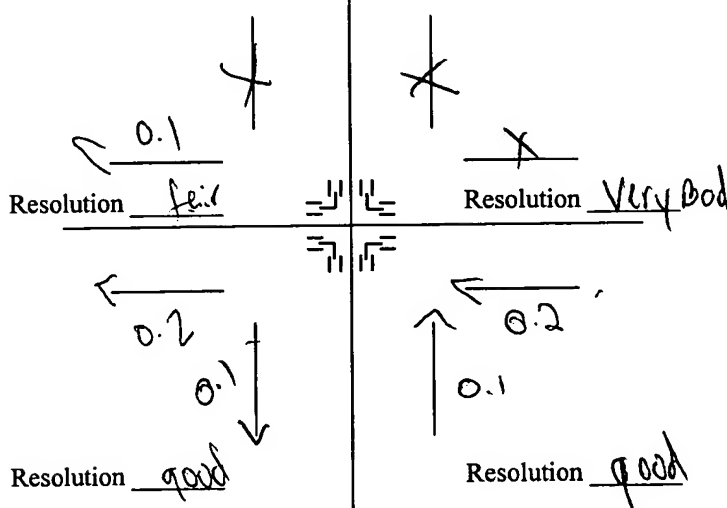


AVG. X 0.15
AVG. Y 0.2

- ☐ Rework
- ☐ Accept

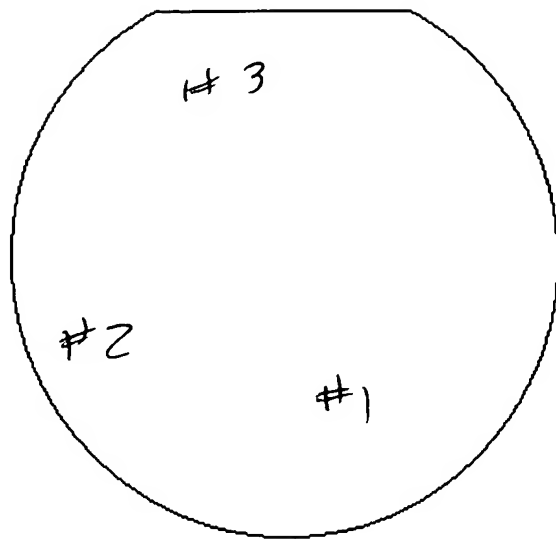
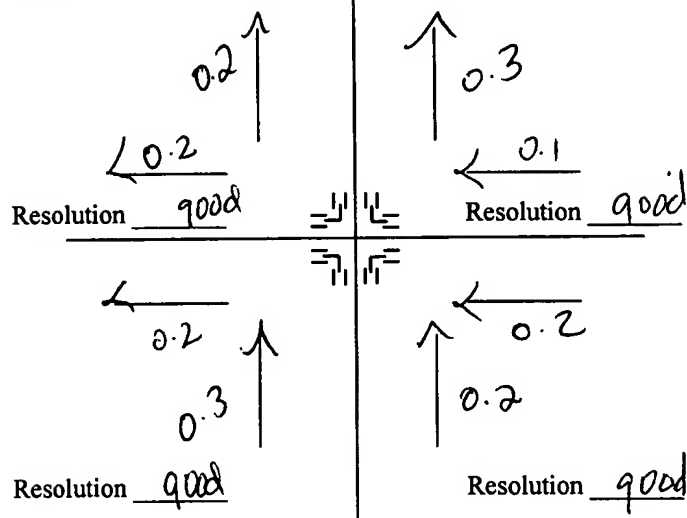
Initial Jue

#3
Location _____

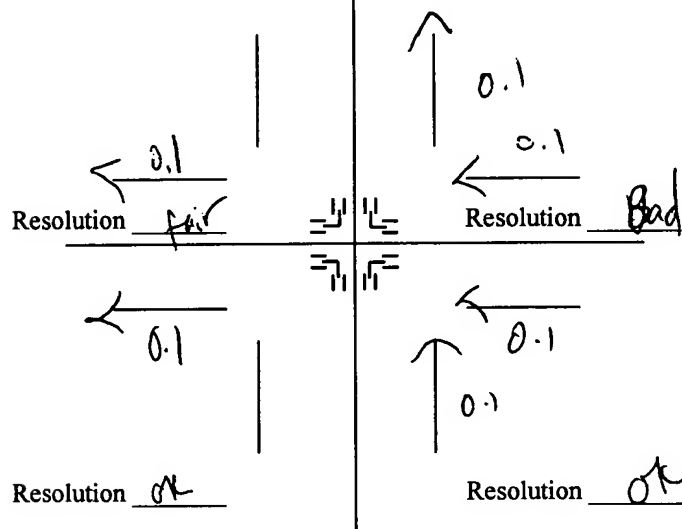


Lot #: Roc-1 W4A Wafer #: No # Layer #: 9

Location 1



Location 2

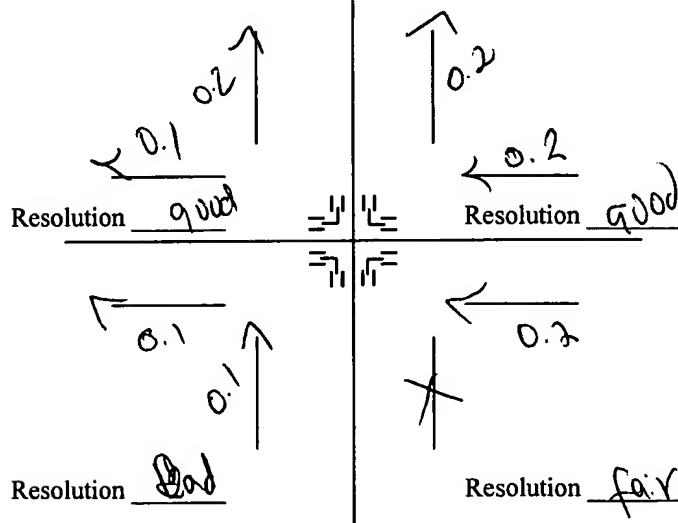


AVG. X .2
AVG. Y .2

☐ Rework
☐ Accept

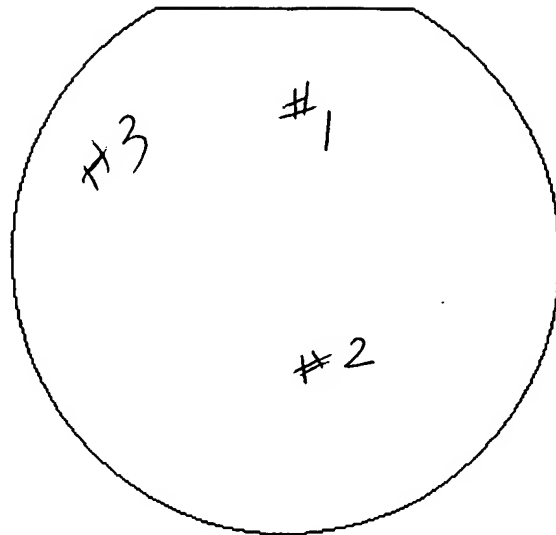
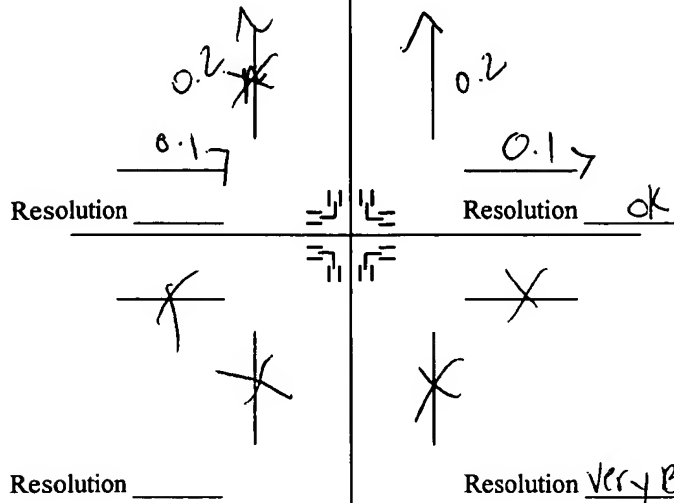
Initial ju

Location 3

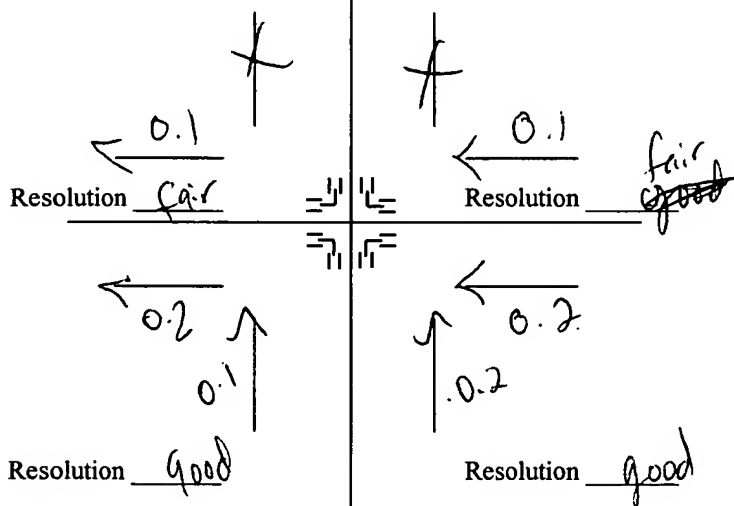


Lot #: Pool w/ 4A Wafer #: no Layer #: 9

Location 1



Location 2

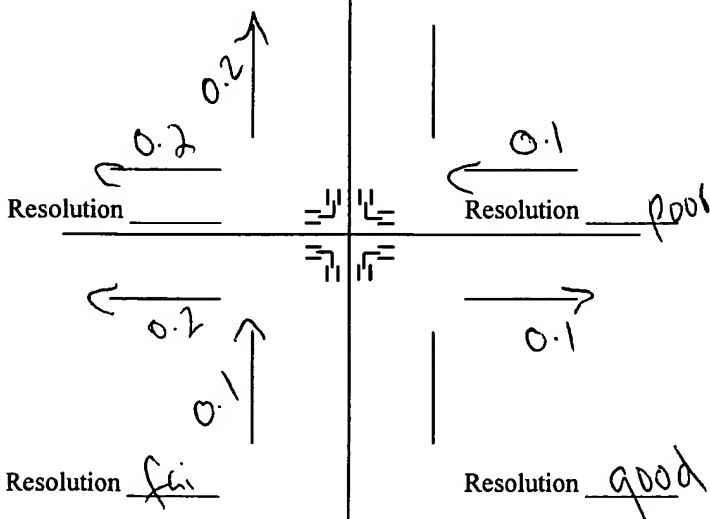


AVG. X _____
AVG. Y _____

- ☐ Rework
☐ Accept

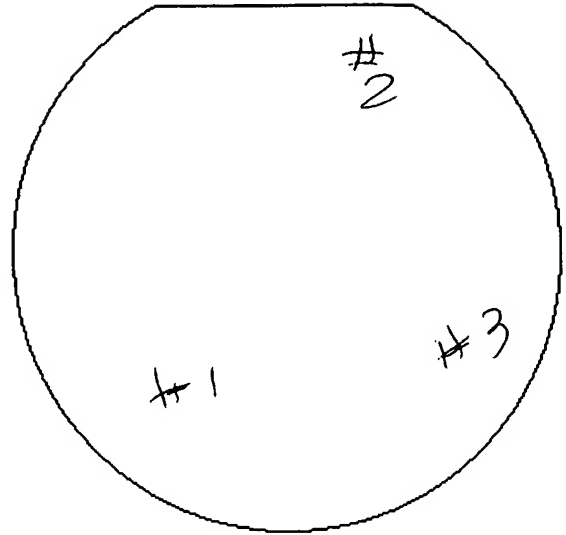
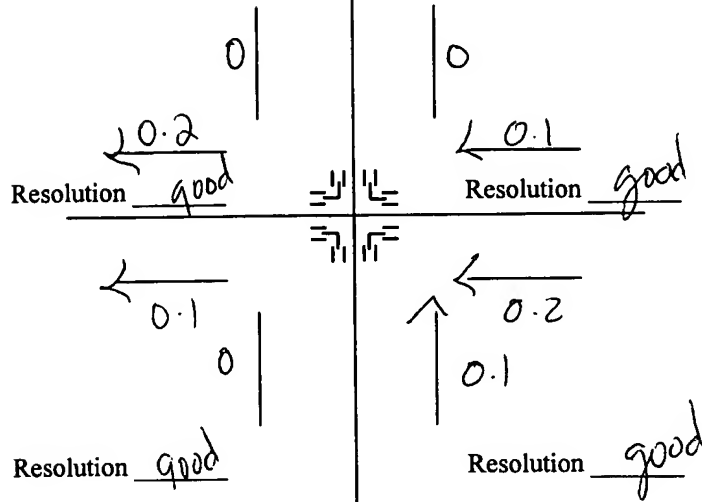
Initial jo

Location 3

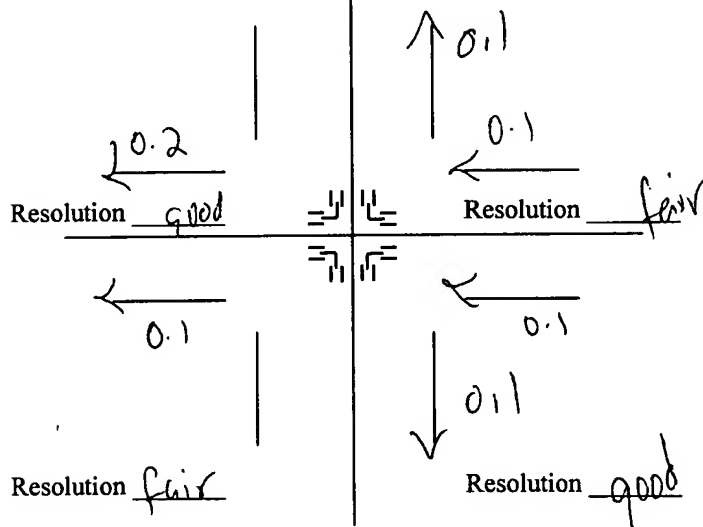


Lot #: Proc 1 lot 4A Wafer #: no # Layer #: 9

Location #1



Location #2

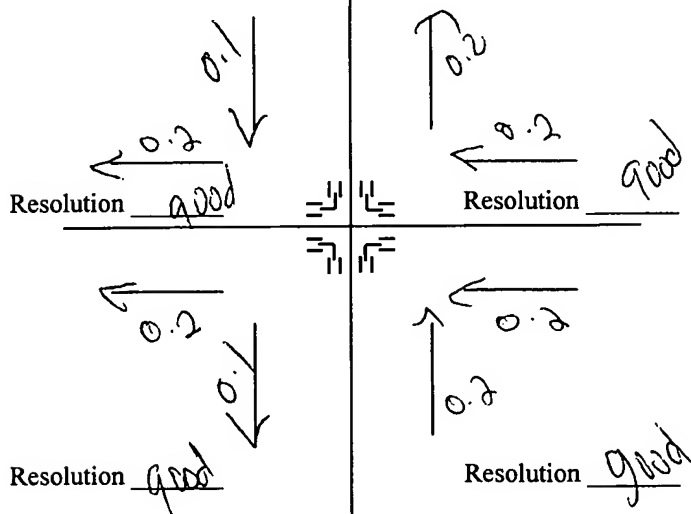


AVG. X _____
AVG. Y _____

☐ Rework
☐ Accept

Initial _____

Location #3









Rockwell Science Center

InP HBT PROCESS LOT FOLLOWER

Charge # 35016 - 87258-0000

M1	Wafers In	Wafers Out	Tools	Step operation	Op rati n recip	Operator/ Date
HMDS Dep	6	6	YES Oven	HMDS Dep	Program 0 ✓	6-5 PM
Apply resist/bake	6	6	Solitec Coat	3500 RPM- 30 Sec Resist type 518 Hotplate 110C - 60 Sec		6-5 PM
Expose Device Mask	6	6	GCA Stepper	Mask / Reticle name ROC1/ Layer 9 Global align to 1 DFAS align to 1 Vernier align to 1 Job name\ pass MAP ROC11.4IM.9	EXP. 52	
Image Reversal Bake	6	6	YES Oven	Ammonia Program: 3		
Flood	6	6	Flood Unit	Dose 2000 mJ		6-6 PM
Develop	6	6	Solitec DEV.	Develop Type: 701 ✓ Develop Time: 60 Sec. ✓		6-6 PM
Inspect wafers			Optical scope	View wafers Equipment type A O Microscope ◊ Check for patterns properly developed ◊ Check alignment (+/- 0.3um) ◊ Smallest Resolution Pattern Read (um) Acceptance: Yes / No		6-6 PM
Descum	6	6	Branson 1	Descum	O2, 500mT, 300W, 4min # 1141	
Dip Etch	6	6	Wet station	Dip, dry	20% HCl 30sec, DI rinse, 30sec, N2 blow dry	
Metal deposition	6	6	CRYO evaporator	Metal dep Ti/Pt/Au Metal dep check	150 / 250 / 7000 Record film thickness from crystal monitor # 74	
Liftoff	6	6	Wet bench	Liftoff Rinse Dry	Acetone soak, >10min IPA soak, 1min N2 blow	
Inspect wafers			Optical scope	Inspect wafers	Metal appearance	
Test						

Wafer #	Identifying marks
IQE 027	 "flat" back/matte
DHBT, no number	
DHBT, no #	 shiny, mostly clean
IQE, 025	 flat color
IQE, 021	 flat color
IQE, 022	 flat color, w/ha a mess!

